

# TA-F6B

US Model  
Canadian Model  
AEP Model  
UK Model  
E Model




## INTEGRATED STEREO AMPLIFIER

### SPECIFICATIONS


#### GENERAL

<b>Power Requirements:</b>	120 V ac, 60 Hz (US, Canadian model) 110 — 120 V and 220 — 240 V ac, adjustable 50/60 Hz (AEP, UK, E model)
<b>Power Consumption:</b>	190 W (US model) 490 VA (Canadian model) 450 W (AEP, E model) 550 W (UK model)
<b>Dimensions:</b>	Approx. 430 (w) x 170 (h) x 390 (d) mm 16 <sup>7</sup> / <sub>8</sub> (w) x 6 <sup>3</sup> / <sub>4</sub> (h) x 15 <sup>3</sup> / <sub>8</sub> (d) inches including projecting parts and controls
<b>Weight:</b>	Approx. 12.5 kg, 27 lb 9 oz (net) Approx. 14.2 kg, 31 lb 5 oz (in shipping carton)

#### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND  MARK ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

#### ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ !

LES COMPOSANTS IDENTIFIÉS PAR UN TRAMÉ ET UNE MARQUE  SUR LES DIAGRAMMES SCHÉMATIQUES, LES VUES EXPLOSÉES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DES SUPPLÉMENTS PUBLIÉS PAR SONY.

#### POWER AMPLIFIER SECTION

<b>Power Output and Total Harmonic Distortion:</b>	With 8 $\Omega$ loads, both channels driven, from 20—20,000 Hz; rated 100 W per channel minimum RMS power, with no more than 0.03 % total harmonic distortion from 250 mW to rated output. (US, Canadian model)
<b>Continuous RMS Power Output:</b>	At 20 Hz—20 kHz 100 W + 100 W (8 $\Omega$ ) According to DIN 45500 100 W + 100 W (8 $\Omega$ ) (AEP, UK, E model)
<b>Power Bandwidth (IHF):</b>	5 Hz — 35 kHz (50 W output, 0.03 % THD, 8 $\Omega$ ) (AEP, UK, E model)
<b>Harmonic Distortion:</b>	Less than 0.03 % at rated output Less than 0.015 % at 1 W/10 W output
<b>Intermodulation (IM) Distortion:</b>	Less than 0.03 % at rated output Less than 0.008 % at 1 W/10 W output (60 Hz : 7 kHz = 4 : 1)
<b>Frequency Response:</b>	DC — 100 kHz $^{+0}_{-1}$ dB

— Continued on page 2 —

# SONY<sup>®</sup>

## SERVICE MANUAL

**S/N Ratio:** Greater than 115 dB, short-circuited input  
**Residual Noise:** Less than 50  $\mu$ V (8  $\Omega$ , network A)  
**Damping Factor:** 50 (8  $\Omega$ , 1 kHz)

**Filters:** LOW  
 6 dB/octave attenuation below 15 Hz  
 HIGH  
 6 dB/octave attenuation above 9 kHz

**Inputs:** POWER INPUT  
 Sensitivity 1.3 V (4.5 dB), for rated output  
 Impedance 50 k $\Omega$

**Residual Noise:**  $-\infty$  (infinity)

**Outputs:** SPEAKER terminals A, B  
 Accept speakers of 4 – 16  $\Omega$   
 (US, Canadian model)  
 Accept speakers of 8 – 16  $\Omega$   
 (AEP, UK, E model)  
 HEADPHONES jack  
 Accepts low and high-impedance stereo headphones

**Inputs:**

	Sensitivity	Impedance	Phono overload (1 kHz)	S/N (weighting network, input level)
PHONO 1	2.5 mV (–50 dB)	50 k $\Omega$	250 mV	85 dB (A, 2.5 mV)
PHONO 2 (HEAD AMP)	0.08 mV (–80 dB)	100 $\Omega$	8 mV	70 dB (A, 0.08 mV)
TUNER AUX 1, 2 TAPE 1, 2	150 mV (–14.5 dB)	50 k $\Omega$	—	105 dB (A, 150 mV)

## PREAMPLIFIER SECTION

**Harmonic Distortion:** Less than 0.003 %  
 (TUNER  $\rightarrow$  PRE OUTPUT, 10 V output, 1 kHz)

**Intermodulation (IM) Distortion:** Less than 0.003 %  
 (60 Hz : 7 kHz = 4 : 1) (TUNER  $\rightarrow$  PRE OUTPUT, 10 V output)

**Frequency Response:** PHONO 1, 2 RIAA equalization  $\pm$ 0.2 dB  
 TUNER  
 AUX 1, 2 ) 2 Hz – 150 kHz  $^{+0}_{-1}$  dB  
 TAPE 1, 2 )

**Tone Controls:** BASS  
 $\pm$ 10 dB at 60 Hz  
 TREBLE  
 $\pm$ 10 dB at 25 kHz

**Outputs:**

	Voltage	Impedance
REC OUT 1, 2	150 mV (–14.5 dB) (13.5 V at max.)	10 k $\Omega$
PRE OUTPUT	1.3 V (4.5 dB) (10 V at max.)	2.5 k $\Omega$ (max.)

0 dB = 0.775 V

## MODEL IDENTIFICATION

### Specification Label

#### UK model

<b>SONY</b> ASCO	INTEGRATED STEREO AMPLIFIER MODEL NO. TA-F6B AC 110-120/220-240V $\sim$ 50/60Hz 550W SERIAL NO. _____ MADE IN JAPAN
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#### Canadian model

<b>SONY</b> ASCO	INTEGRATED STEREO AMPLIFIER MODEL NO. TA-F6B AC 120V 60Hz 490VA SERIAL NO. _____ MADE IN JAPAN
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#### AEP, E model

<b>SONY</b> ASCO	INTEGRATED STEREO AMPLIFIER MODEL NO. TA-F6B AC 110-120/220-240V $\sim$ 50/60Hz 450W SERIAL NO. _____ MADE IN JAPAN
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#### US model

<b>SONY</b> ASCO	INTEGRATED STEREO AMPLIFIER MODEL NO. TA-F6B AC 120V 60Hz 190W SERIAL NO. _____ MADE IN JAPAN
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# SERVICING NOTES

## 1. REPLACEMENT OF THE TRANSFORMERS IN THE PULSE-LOCKED POWER-SUPPLY CIRCUIT

The lead wire arrangement for each of T601-603 in the inverter circuit are shown in Figs. 1 and 2.

As the repair parts, T603 is formed by an iron core and a coil winding, but T601 and T602 are only iron core. Thus, if the coils are defective, arrange a new transformers as shown in Fig. 1. Note that the lead lengths must be exact. Also wind the coil carefully.

The lead wires ⑤ to ⑧ are as follows:

- lead wire diameter: ⑦ and ⑧ are of equal diameter  
⑤ and ⑥ are of equal diameter
- lead wire length: ⑤ longer than ⑥  
⑦ longer than ⑧

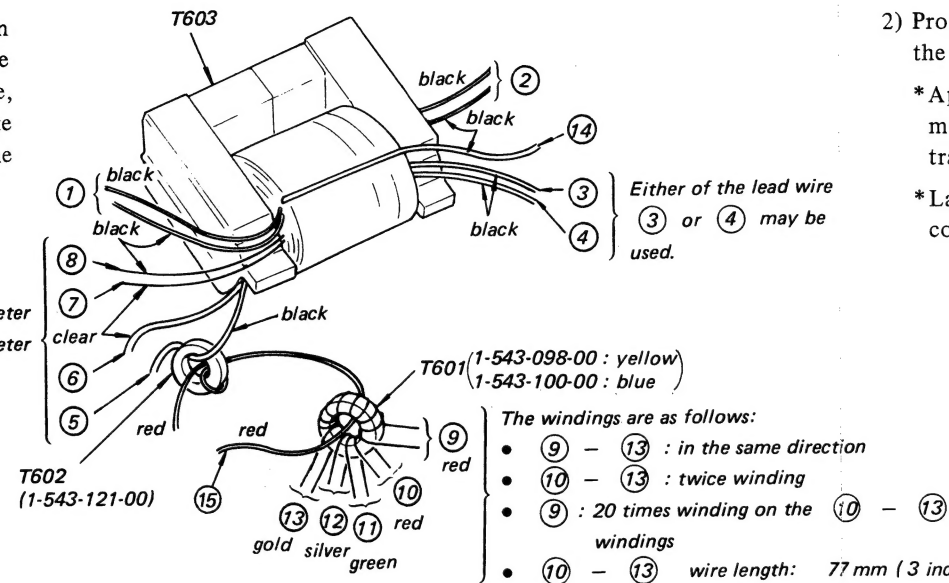


Fig. 1

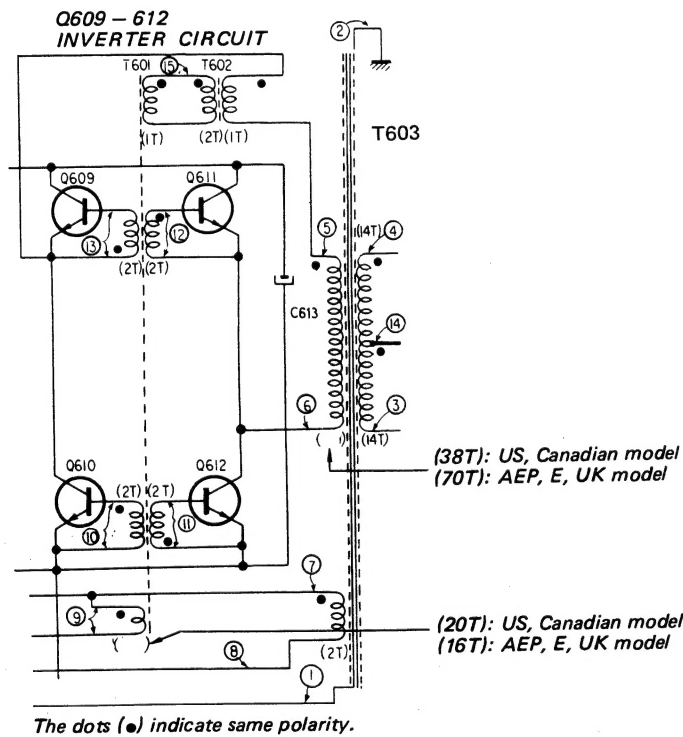
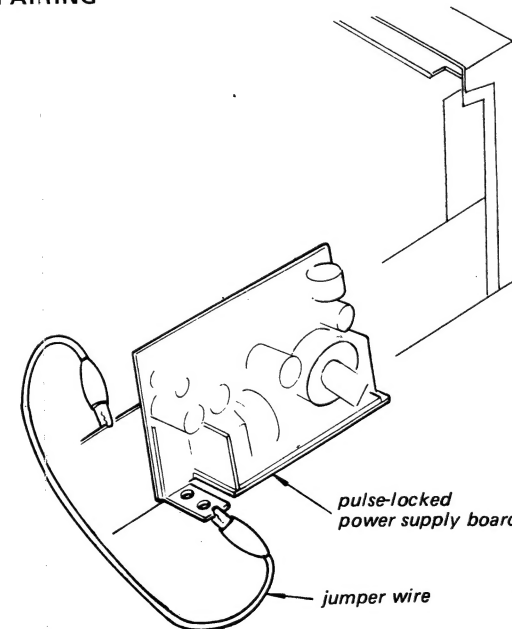


Fig. 2

## 2. PULSE-LOCKED POWER SUPPLY BOARD REPAIRING

This set has a pulse-locked power-supply circuit which is quite different from a conventional power-supply circuit. The pulse-locked power-supply directly rectifies and smooths the ac input power to produce the higher dc voltages required in the power supply circuit. When servicing this set, note the following.

- 1) To prevent unwanted radiation due to pulse signals in the pulse-locked power-supply circuit, the pulse-locked power-supply board is shielded by the aluminum diecast box.
- 2) The negative circuit of the secondary rectifier in the pulse-locked power-supply circuit is grounded by screws in the aluminum diecast box. When checking the pulse-locked power-supply board out of the box, use a jumper wire as shown.



## 3. INVERTER CIRCUIT TRANSISTOR REPLACEMENT (Q609-612)

- 1) Be sure that there are no bits of solder and wire ends on the places marked \*2 in Fig. 3.
- 2) Proceed the following items surely when replacing the transistors (Q609-612).

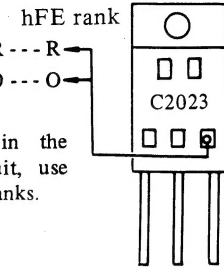
\*Apply thermal compound coat to the positions marked \*1 and \*2 in Fig. 3 before mounting the transistors.

\*Lay the F-shaped plate flat to ensure uniform contact with all 4 transistors (see Fig. 4).

AEP, UK, E model

Q609-612 8-729-302-31 2SC2023-R --- R  
8-729-302-32 2SC2023-O --- O

Note: When replacing Q609-Q612 in the pulse-locked power-supply circuit, use those which have the same hFE ranks.



US, Canadian model

Q609-612 8-729-308-72 2SC1986D-O --- O

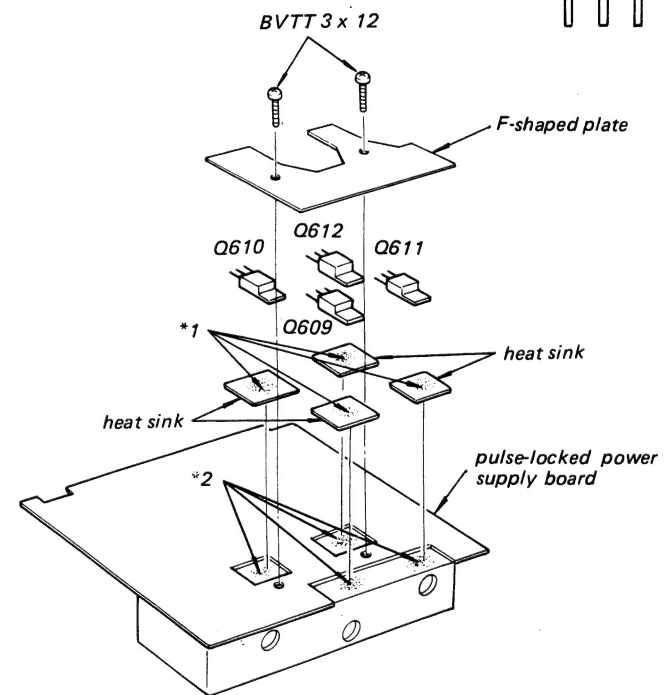
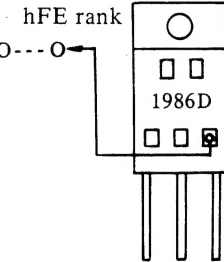


Fig. 3

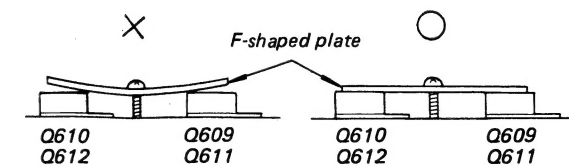
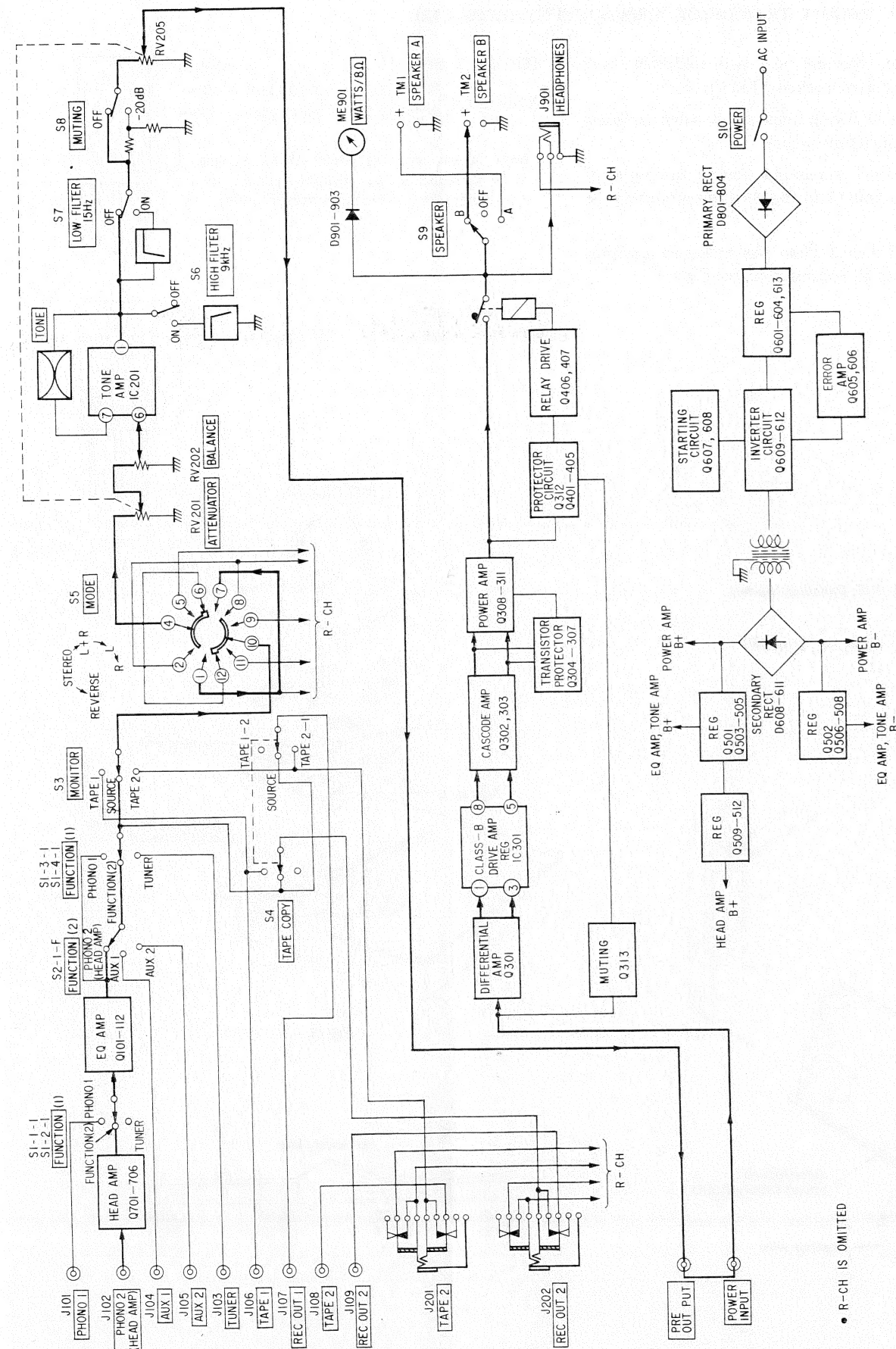


Fig. 4

## SECTION 1 BLOCK DIAGRAM

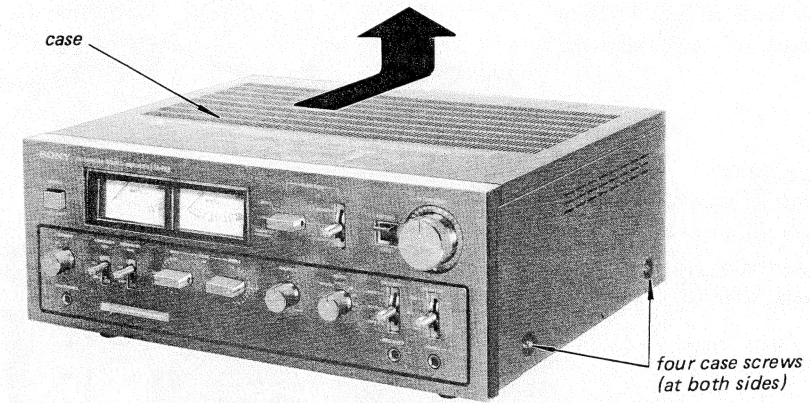


• R-CH IS OMITTED

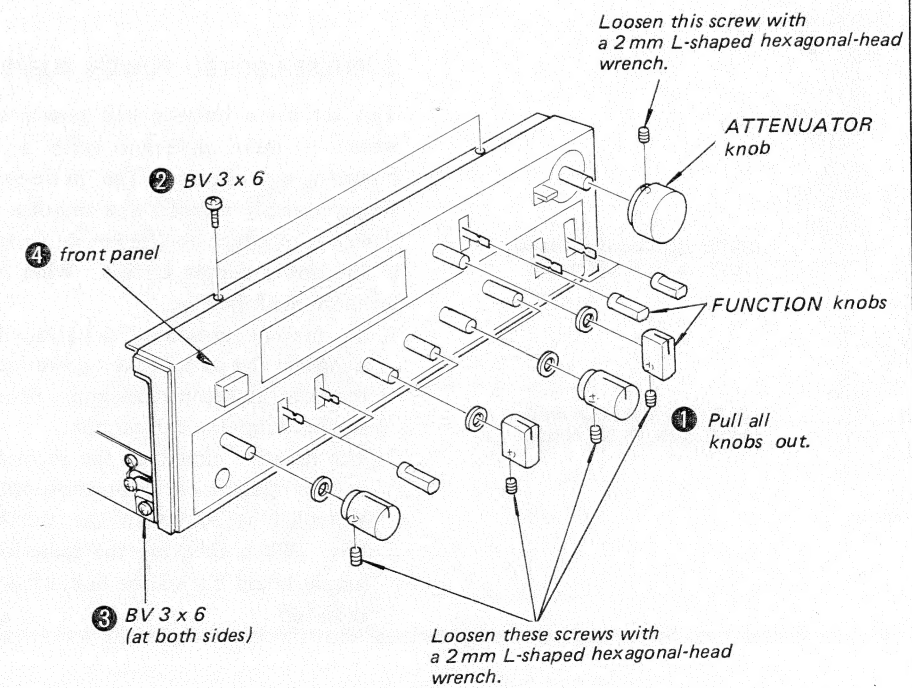
## SECTION 2 DISASSEMBLY

- Follow the disassembly procedure in the numerical order given.

### CASE REMOVAL

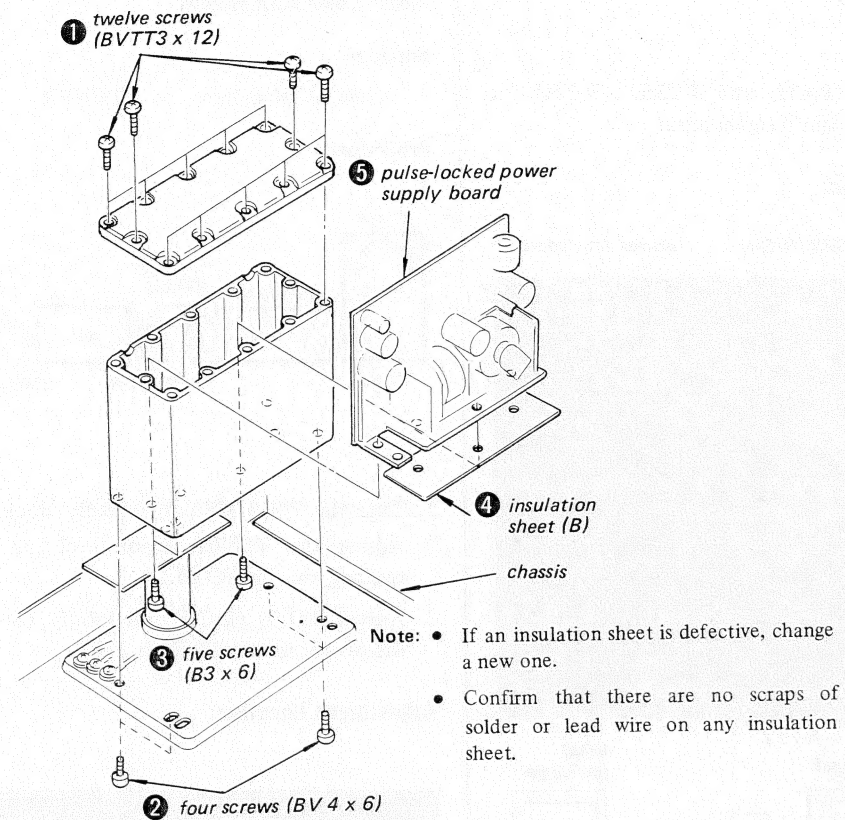


### FRONT PANEL REMOVAL





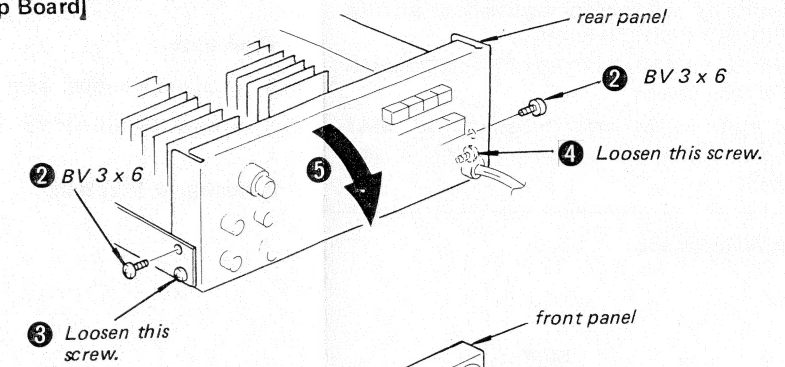
### PULSE-LOCKED POWER SUPPLY BOARD REMOVAL



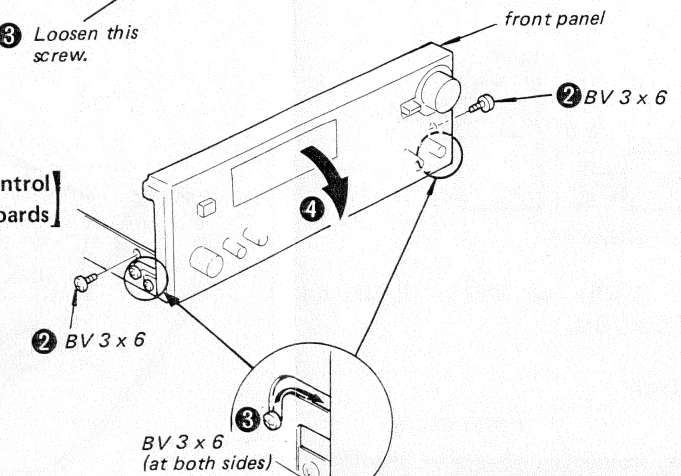
### CIRCUIT BOARDS CHECKING AND REPAIRING

1 Remove the case (See page 6).

[Head Amp Board]

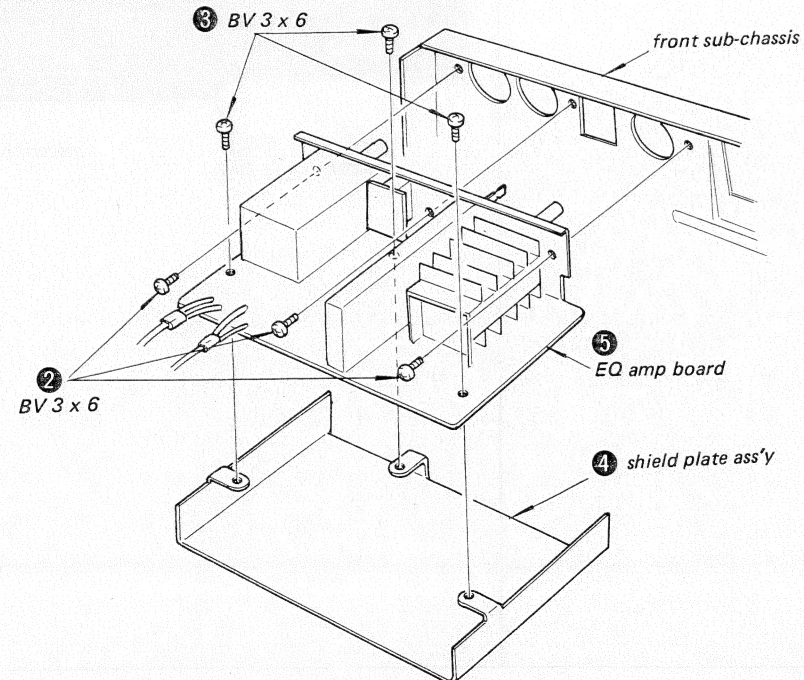


[EQ Amp, Control and Meter Boards]



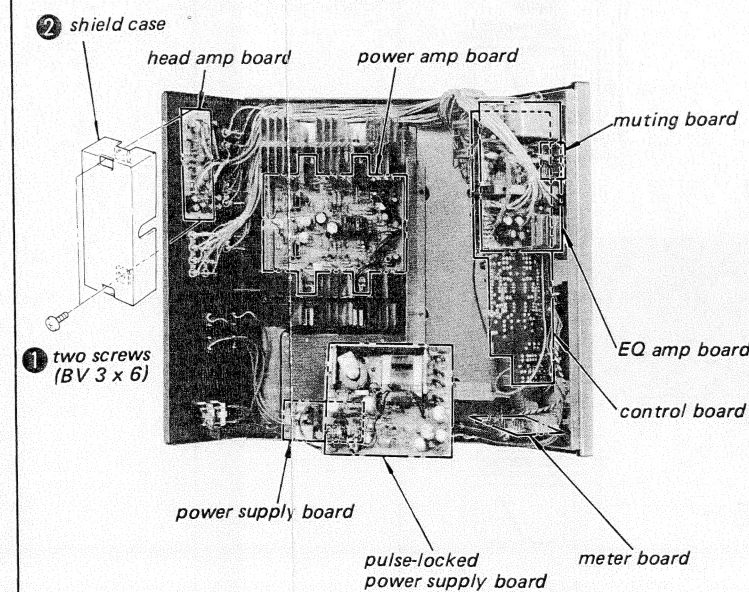
### EQ AMP BOARD REMOVAL

1 Pull out the knobs (ATTENUATOR, FUNCTION).

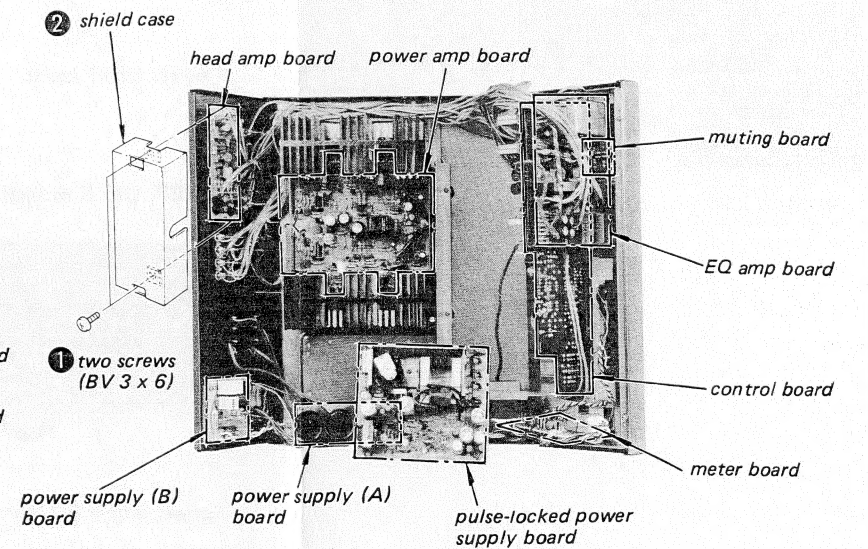


Each circuit board is located as shown below.

(US, Canadian model)



(AEP, UK, E model)



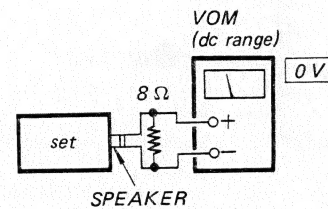


## SECTION 3 ADJUSTMENTS

- Note:** 1. DC BIAS and DC BALANCE adjustments should be performed about several minutes later after the POWER switch (S10) is turned on.
2. Repeat DC BIAS and DC BALANCE adjustments two or three times.
3. After replacing the power transistors, DC BIAS and DC BALANCE adjustments should be performed.

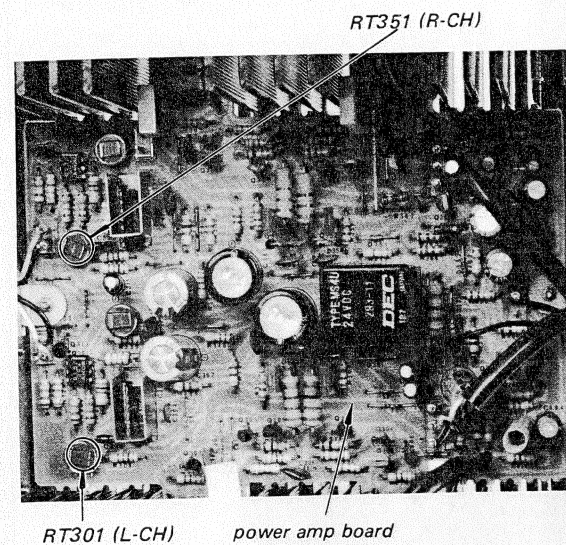
### DC Balance Adjustment

#### Procedure:



Adjust RT301 (L-CH) and RT351 (R-CH) for 0 V reading on the VOM.

#### Adjustment Location:

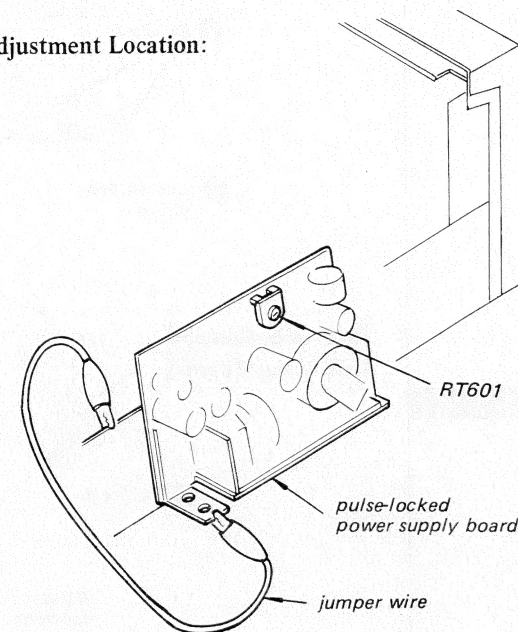


### DC Voltage Adjustment

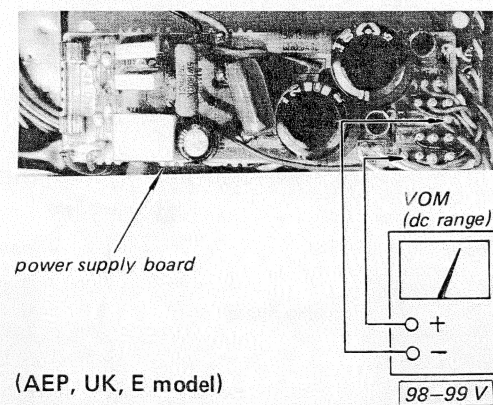
#### Procedure:

1. Connect a jumper wire.
2. Adjust RT601 for 98–99 V reading on the VOM.

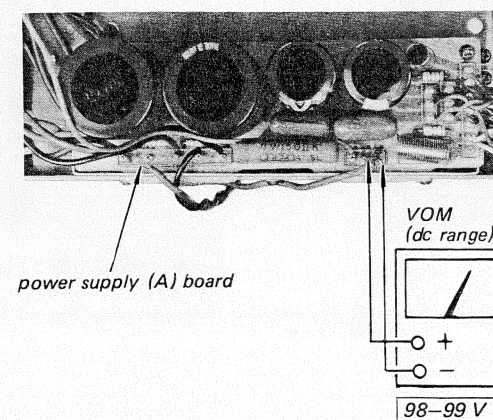
#### Adjustment Location:



(US, Canadian model)



(AEP, UK, E model)

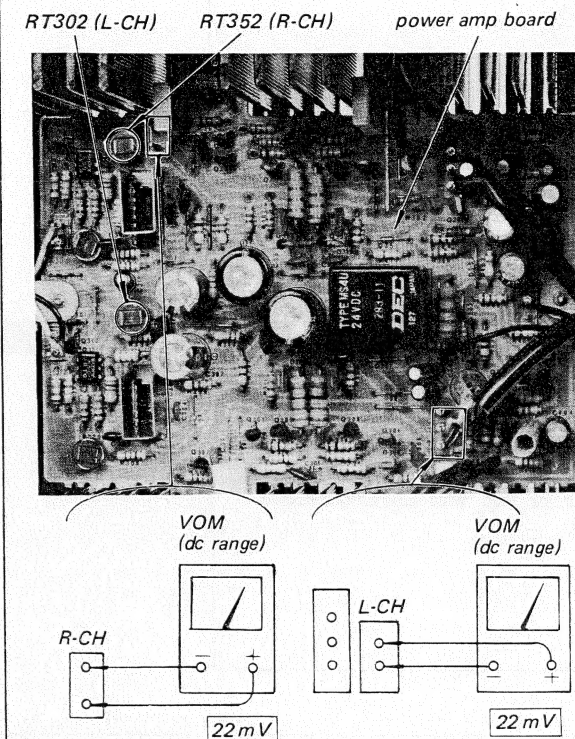


### DC Bias Adjustment

#### Procedure:

Adjust RT302 (L-CH) and RT352 (R-CH) for 22 mV reading with no signal input.

#### Adjustment Location:

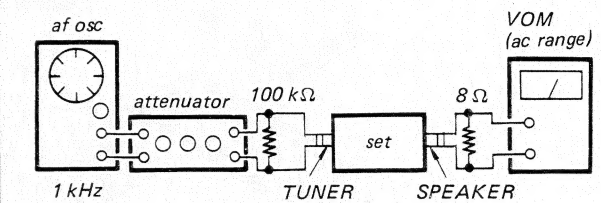


### Meter Level Adjustment

#### Setting:

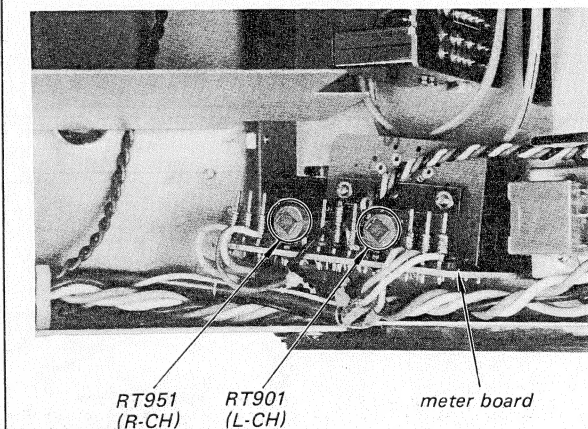
FUNCTION switch: TUNER

#### Procedure:



1. Turn the VOLUME control fully clockwise.
2. Adjust the TUNER input level for 2.83 V (1 W) reading on the VOM.
3. Adjust RT901 (L-CH) and RT951 (R-CH) so that the power meters indicate 1 W.

#### Adjustment Location:



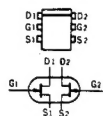
## SECTION 4

### DIAGRAMS

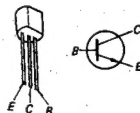
#### • Replacement Semiconductors

For replacement, use semiconductors except in ( ).

Q101, 151: 2SK97



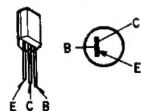
Q110, 160: 2SD667  
Q510: 2SC1475 (2SC1670)



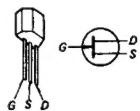
D102, 103: EQB01-26 (EQA01-26R)  
D152, 153: EQB01-26 (EQA01-26R)  
D201, 202: EQB01-21 (EQA01-21R)  
D251, 252: EQB01-21 (EQA01-21R)



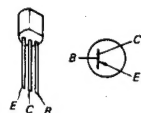
Q102, 103, 106, 108  
Q152, 153, 156, 158  
Q705, 706, 755, 756 } : 2SA872E (2SA872)



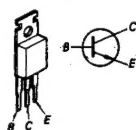
Q501, 502: 2SK42-4 (2SK42)



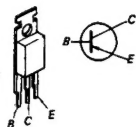
Q111, 161: 2SB647  
Q506, 507: 2SA639 (2SA893)



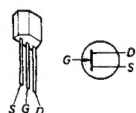
Q503: 2SC1061



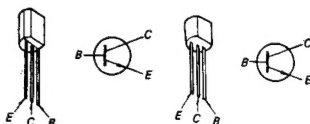
Q508: 2SA671



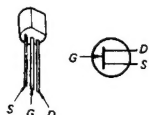
Q104, 154: 2SK23A-840 (blue) (2SK23A)



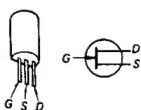
Q504, 505: 2SC1775F (2SC1890)  
Q511, 512



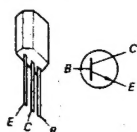
Q105, 155, 509: 2SK30A



Q107, 112: 2SK43-4 (2SK43)  
Q157, 162



Q701-704: 2SC1637-1 (2SC1637)  
Q751-754



IC201, 251: HA1457

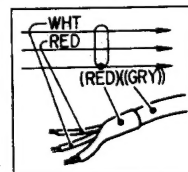


D101, 151: MV12N



#### Note:

- Color code of sleeving over the end of the jacket.



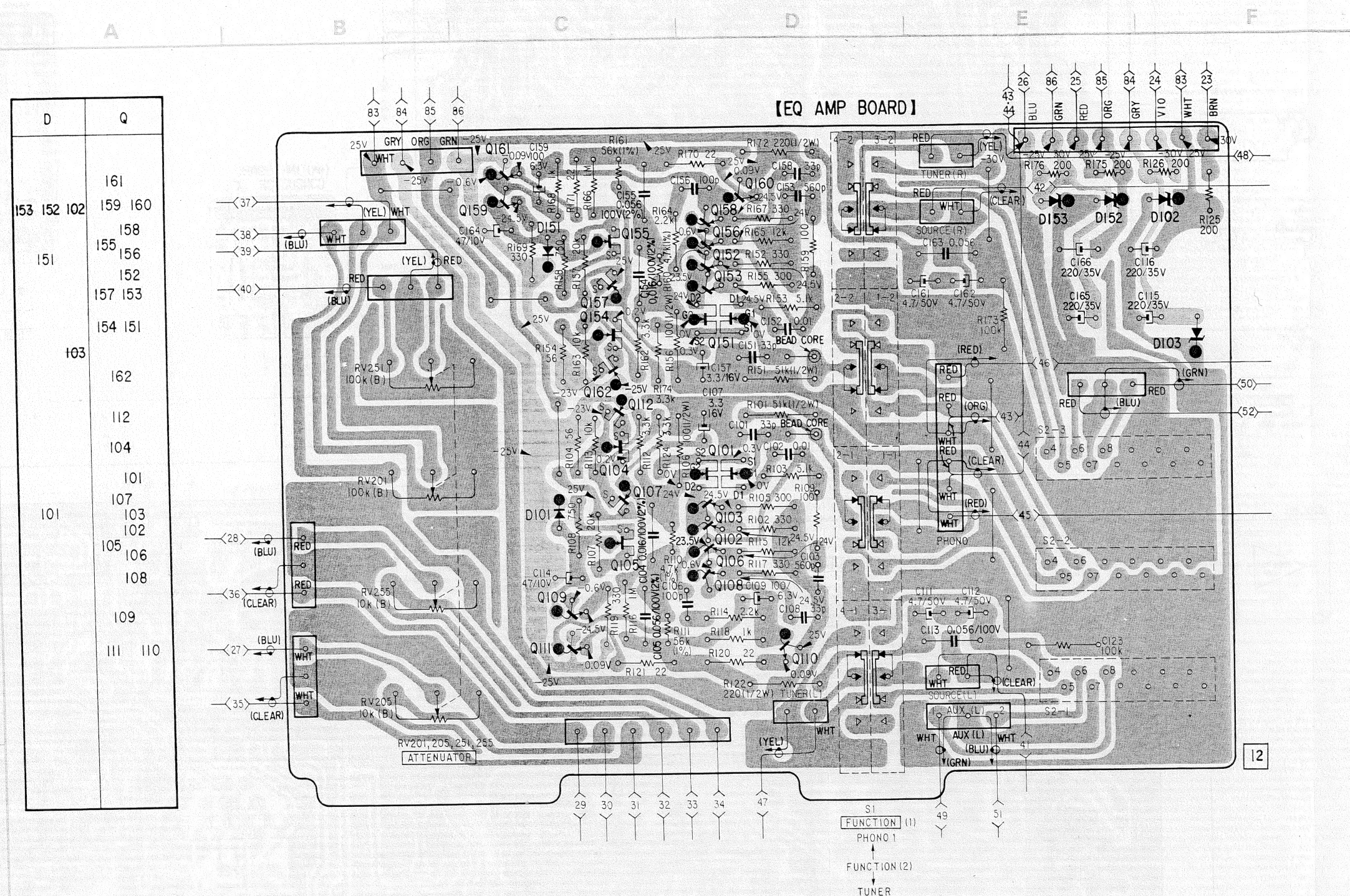
- ○ — : parts extracted from the component side.

- ■ : B+ pattern

- ■ : B- pattern



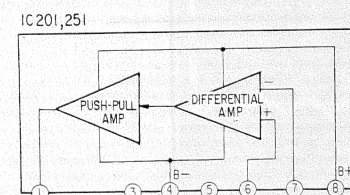
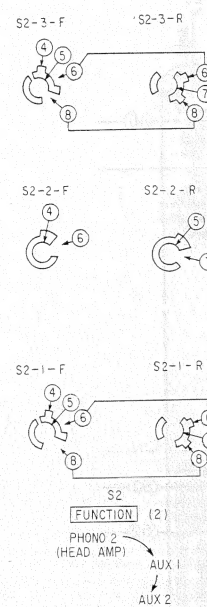
4-1. EQ AMP BOARD MOUNTING DIAGRAM  
— Conductor Side —





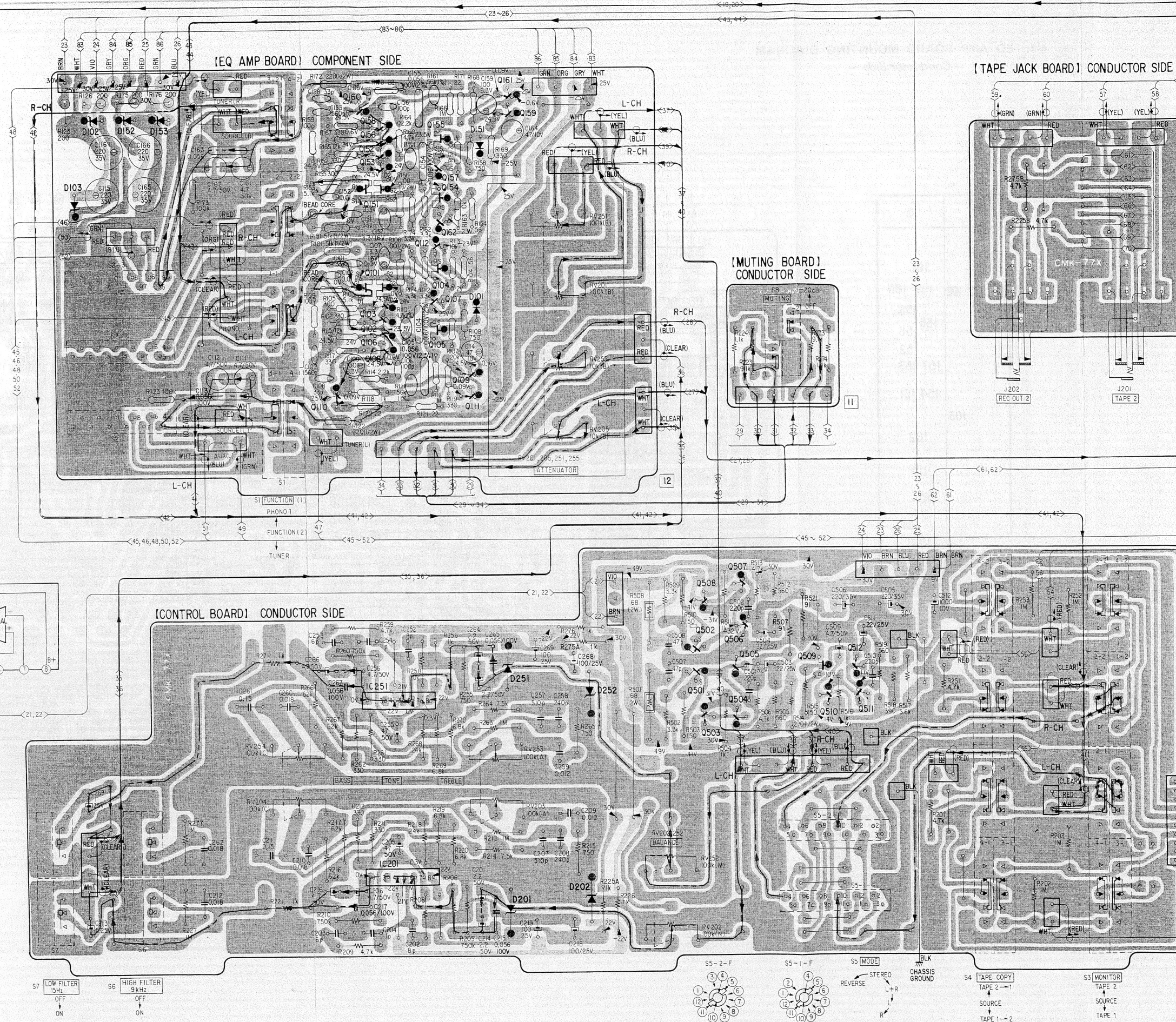
## 4-2. PREAMP SECTION MOUNTING DIAGRAM

Q, IC	D
161	
160 159	102
158 155	153
152	151
153 157	
151	103
162	
112	
104	
101	
103 107	101
102 105	
106	
108	
109	
110 111	
507	
508	
506	
502	
505 509	251
501 512	
IC251	252
510, 511	
503 504	
IC201	202
	201
Q, IC	D

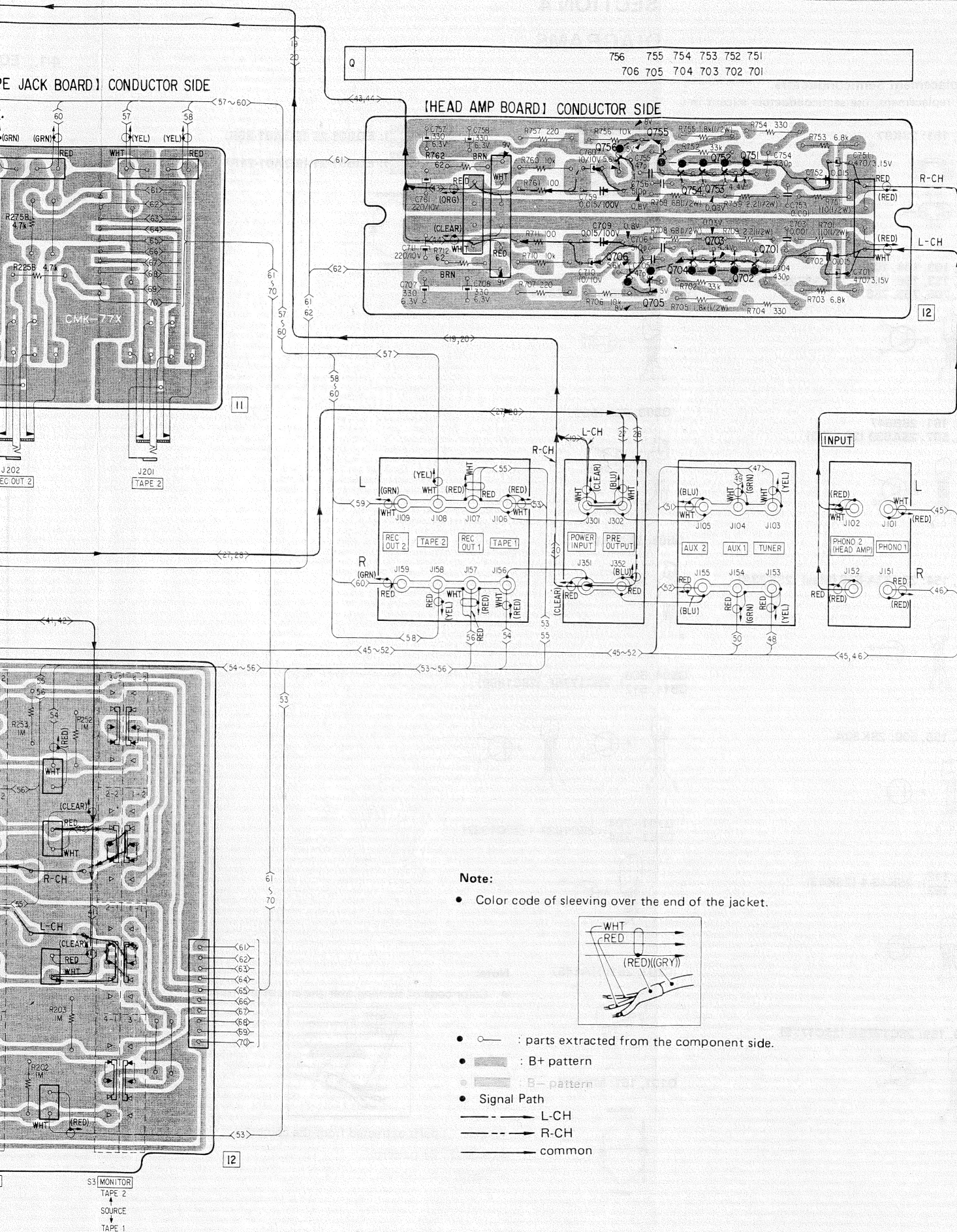


POWER SUPPLY BOARD

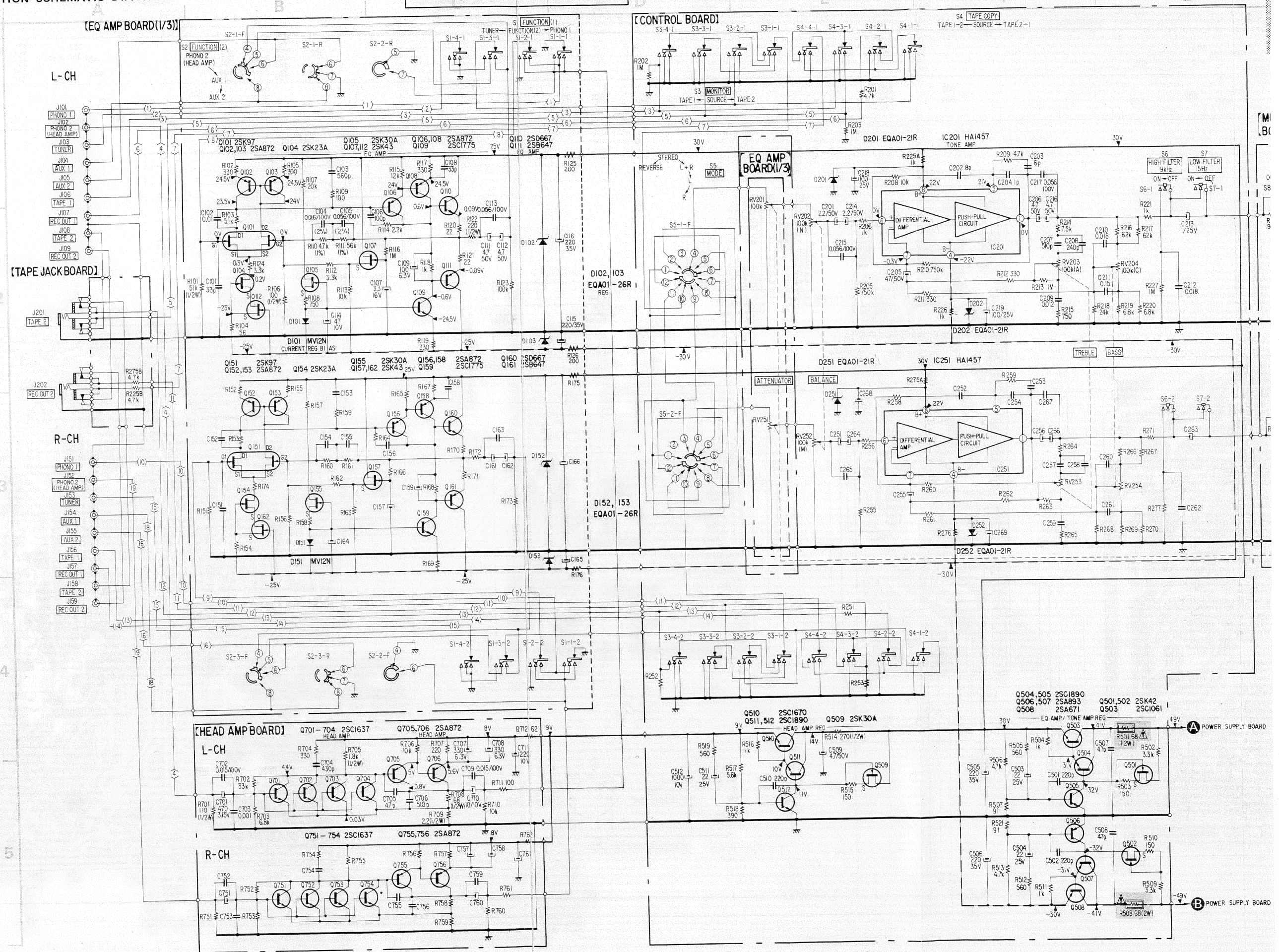
B









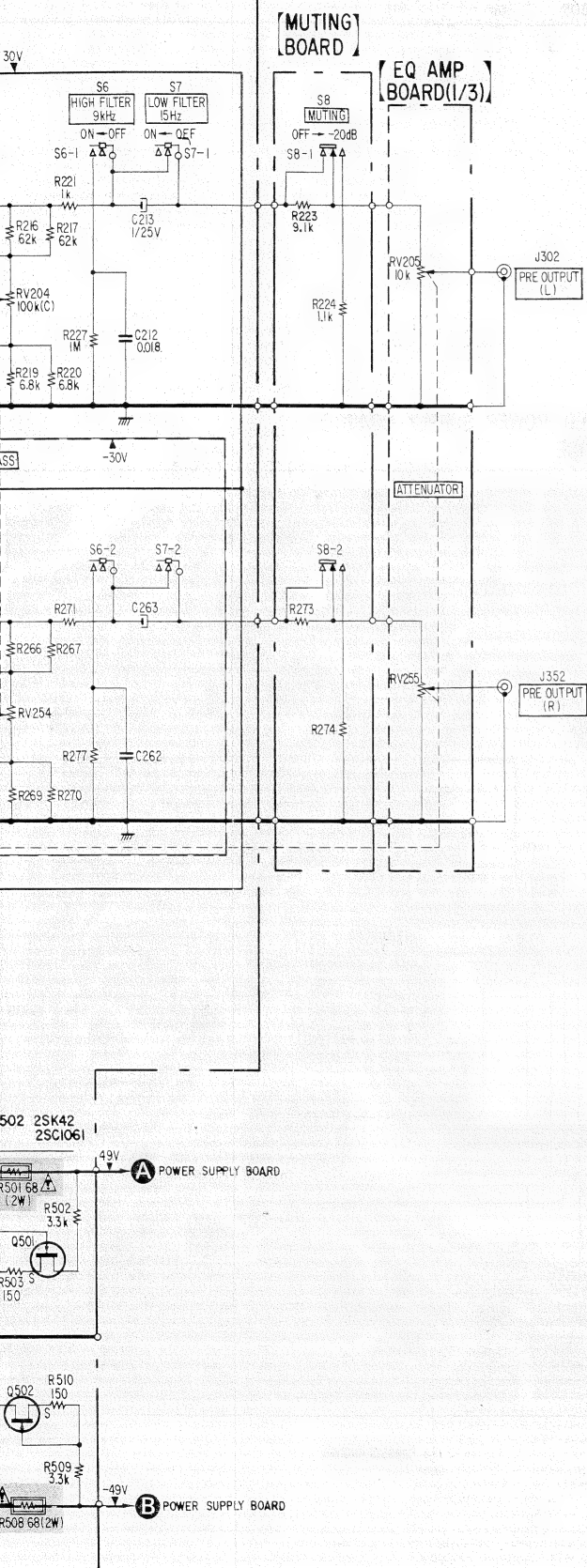










Note: The components identified by shading and mark  are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.



#### Note:

- Components for right channel have same values as for left channel. Reference numbers are coded from 151, 251 or 751.
- All capacitors are in  $\mu\text{F}$  unless otherwise noted.  $\text{pF} = \mu\mu\text{F}$  50 WV or less are not indicated except for electrolytics.
- All resistors are in ohms,  $\frac{1}{4}\text{W}$  unless otherwise noted.  $\text{k}\Omega = 1000 \Omega$ ,  $\text{M}\Omega = 1000 \text{k}\Omega$
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
-  : nonflammable resistor
- 1 % or 2 % indicates component tolerance.
-  : panel designation
-  : B+ bus.
-  : B- bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no signal conditions with a VOM (20  $\text{k}\Omega/\text{V}$ ).
- Voltage variations may be noted due to normal production tolerances.
- Switch

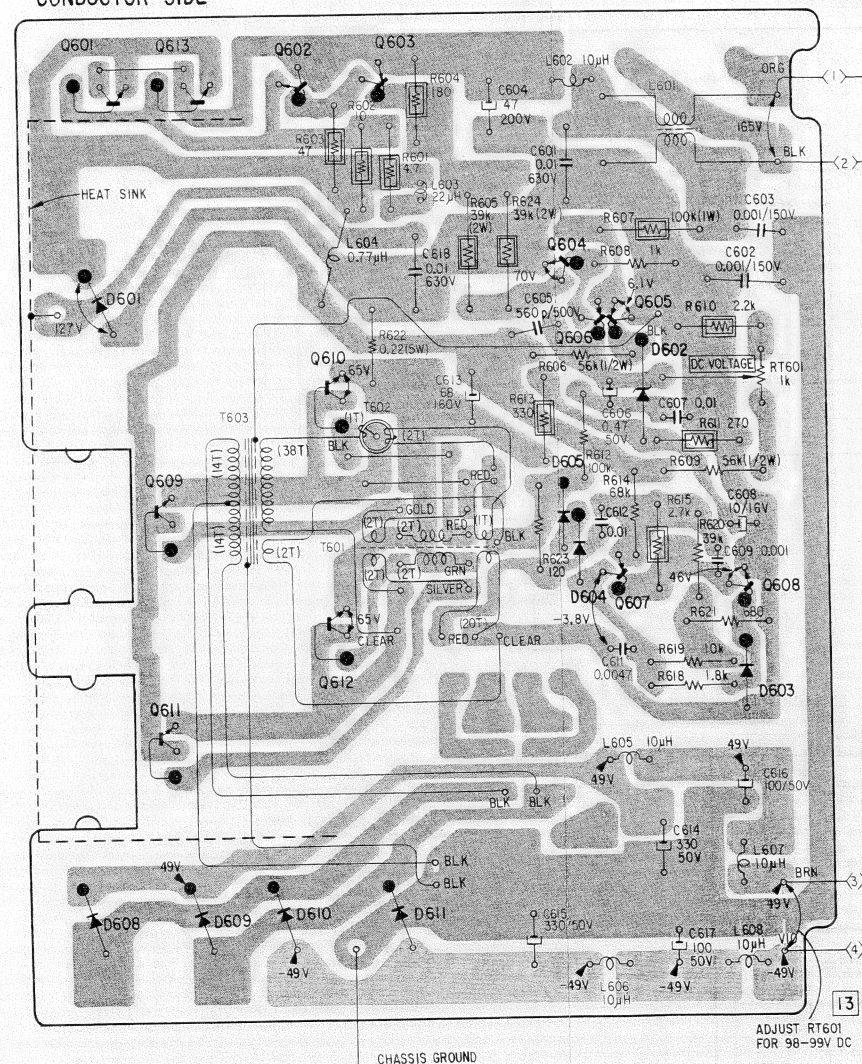
Ref. No.	Switch	Position
S1-1-1, 2 S1-2-1, 2 S1-3-1, 2 S1-4-1, 2	FUNCTION (1)	FUNCTION (2)
S2-1-F, R S2-2-F, R S2-3-F, R	FUNCTION (2)	PHONO 2 (HEAD AMP)
S3-1-1, 2 S3-2-1, 2 S3-3-1, 2 S3-4-1, 2	MONITOR	SOURCE
S4-1-1, 2 S4-2-1, 2 S4-3-1, 2 S4-4-1, 2	TAPE COPY	SOURCE
S5-1-F, 2-F	MODE	STEREO
S6-1, 2	HIGH FILTER 9 kHz	OFF
S7-1, 2	LOW FILTER 15 Hz	OFF
S8-1, 2	MUTING	OFF



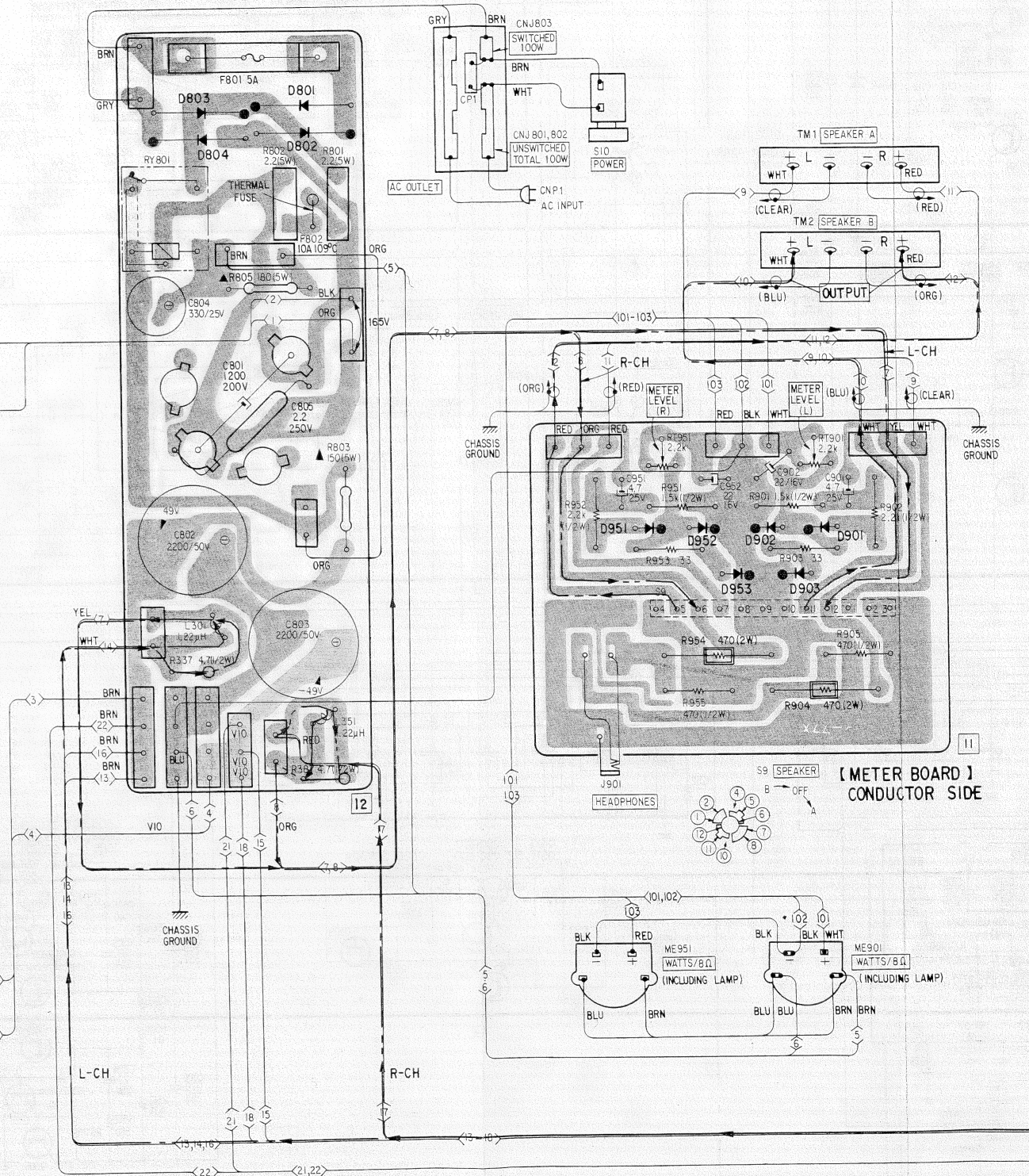
# 4-4. POWER AMP SECTION MOUNTING DIAGRAM (US, Canadian model)

Q	601	613	602	603												
		609		610	604	606	605				803	801	951	952	902	901
IC		611		612			607	608								
D	601				605	602	603			804	802					
	608	609	610	611		604										

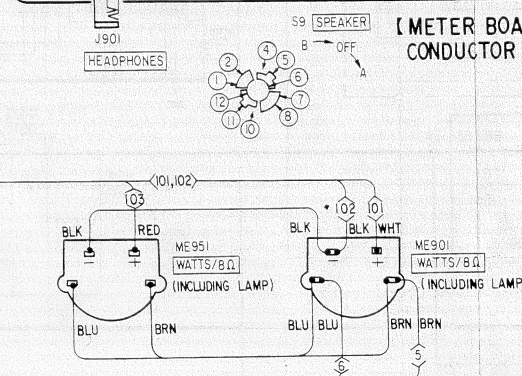
【PULSE-LOCKED POWER SUPPLY BOARD】  
CONDUCTOR SIDE



【POWER SUPPLY BOARD】 COMPONENT SIDE

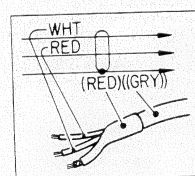


【METER BOARD】  
CONDUCTOR SIDE



## Note:

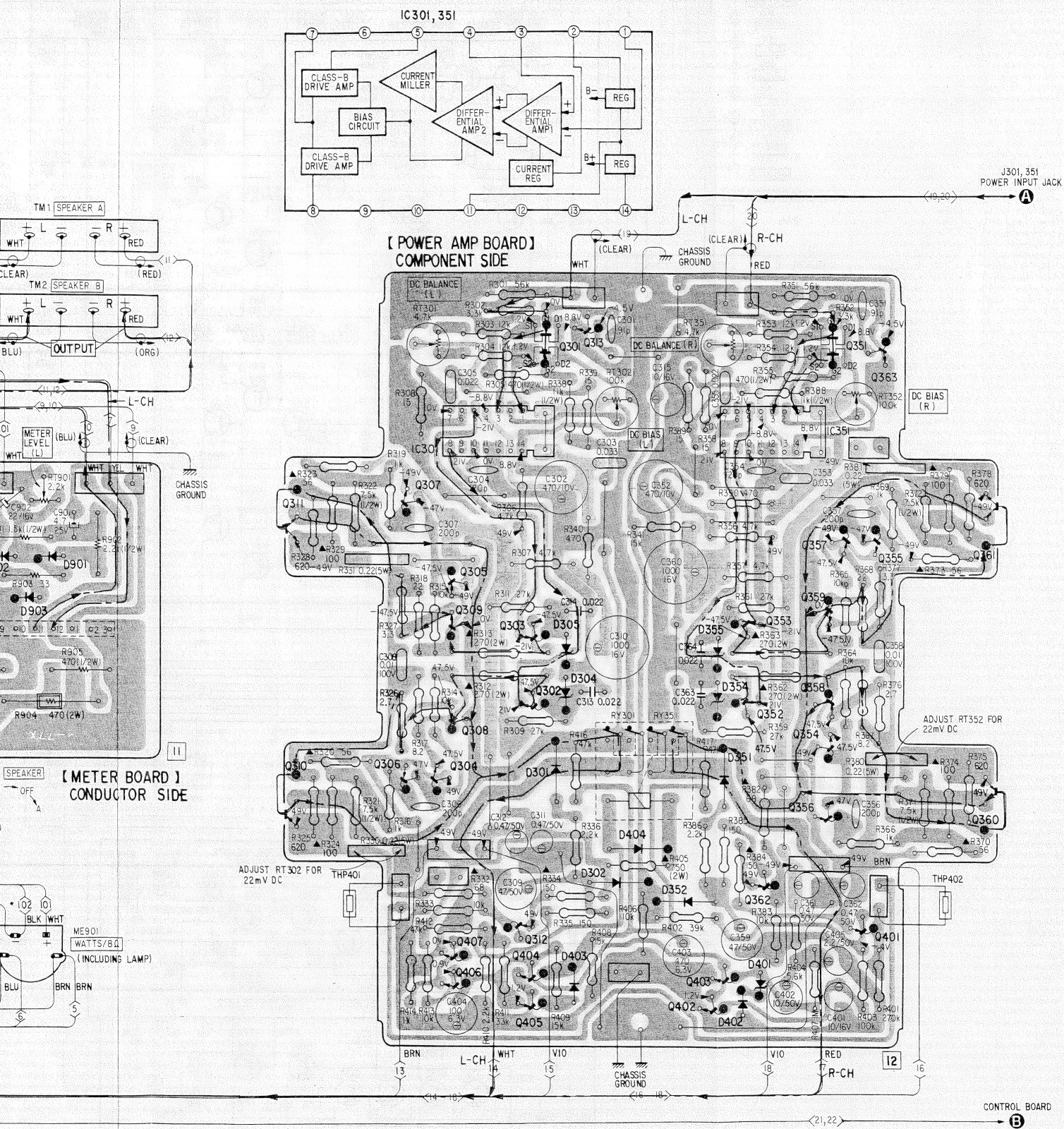
- Color code of sleeving over the end of the jacket.



- — : parts extracted from the component side.
- : B+ pattern
- : B- pattern
- Signal Path
  - L-CH
  - R-CH
  - common
- ▲ : nonflammable resistor.



311	307	305 309 308 304 407 406	IC301	303 302 312 404 405	301	313	353 403 402	352 IC351 362	351 359 358 354 356	357 355 401	363	361 360	Q IC
902	901			305 301	304		355 354 352	351 402					D
903				403	302	404	401						







**TA-F6B**      **TA-F6B**










**Note:** The components identified by shading and mark  are critical for safety. Replace only with part number specified.

**Note:** Les composants identifiés par un trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

**Note:**

- Components for right channel have same values as for left channel. Reference numbers are coded from 351 or 951.
- All capacitors are in  $\mu\text{F}$  unless otherwise noted.  $\text{pF} = \mu\mu\text{F}$  50 WV or less are not indicated except for electrolytics.
- All resistors are in ohms,  $\frac{1}{4}\text{W}$  unless otherwise noted.  $\text{k}\Omega = 1000\ \Omega$ ,  $\text{M}\Omega = 1000\ \text{k}\Omega$
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
-  : nonflammable resistor.
-  : panel designation
-  : B+ bus.
-  : adjustment for repair.
-  : B- bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no signal conditions with a VOM (20  $\text{k}\Omega/\text{V}$ ).
- Voltage variations may be noted due to normal production tolerances.

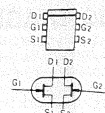
• Switch

Ref. No.	Switch	Position
S9	SPEAKER	B
S10	POWER	OFF

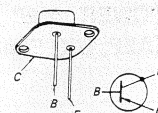
• Replacement Semiconductors

For replacement, use semiconductors except in ( ).

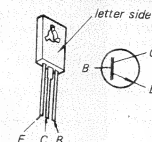
Q301, 351: 2SK58



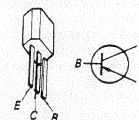
Q310, 360: 2SB655



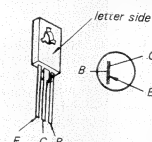
Q302, 352: 2SD668



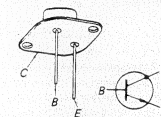
Q305, 306, 312  
Q356, 357, 362  
Q401, 405 } : 2SA678



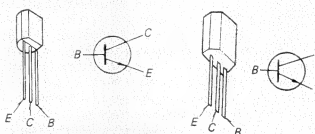
Q303, 353: 2SB648



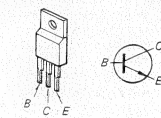
Q311, 361: 2SD675



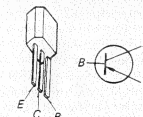
Q304, 307  
Q313, 354  
Q355, 363  
Q402-404  
Q406, 407 } : 2SC1364 (2SC634A)



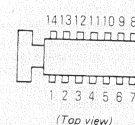
Q601, 613: 2SC1986D-R (2SC1986D)  
Q609-612: 2SC1986D-O



Q605, 606: 2SA678 (2SA844)



IC301, 351: CX171

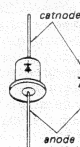


D301, 302, 351, 352  
D402, 404, 603-605  
D903, 953 } : 1S1555

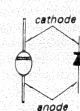
D602: RD5.6E (RD5.6E-B)  
D901, 902: 1T22AM (1T22)  
D951, 952



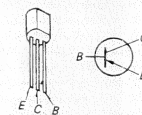
D601, 608-611: S34



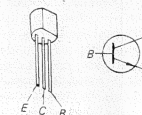
D801-804: U05G (U05E)



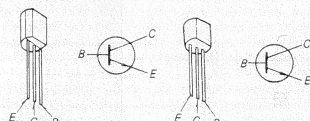
Q603: 2SA896



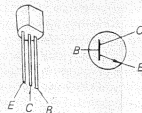
Q604: 2SC1811



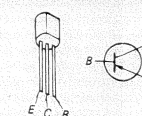
Q608: 2SC1775F (2SC1890)



Q309, 359: 2SD667

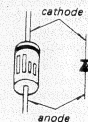


Q308, 358: 2SB647  
Q607: 2SA639S (2SA893)

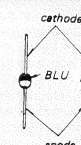


D304, 305: EQB01-21 (EQA01-21R)  
D354, 355

D401: EQB01-07 (EQA01-07)



D403: MV12N

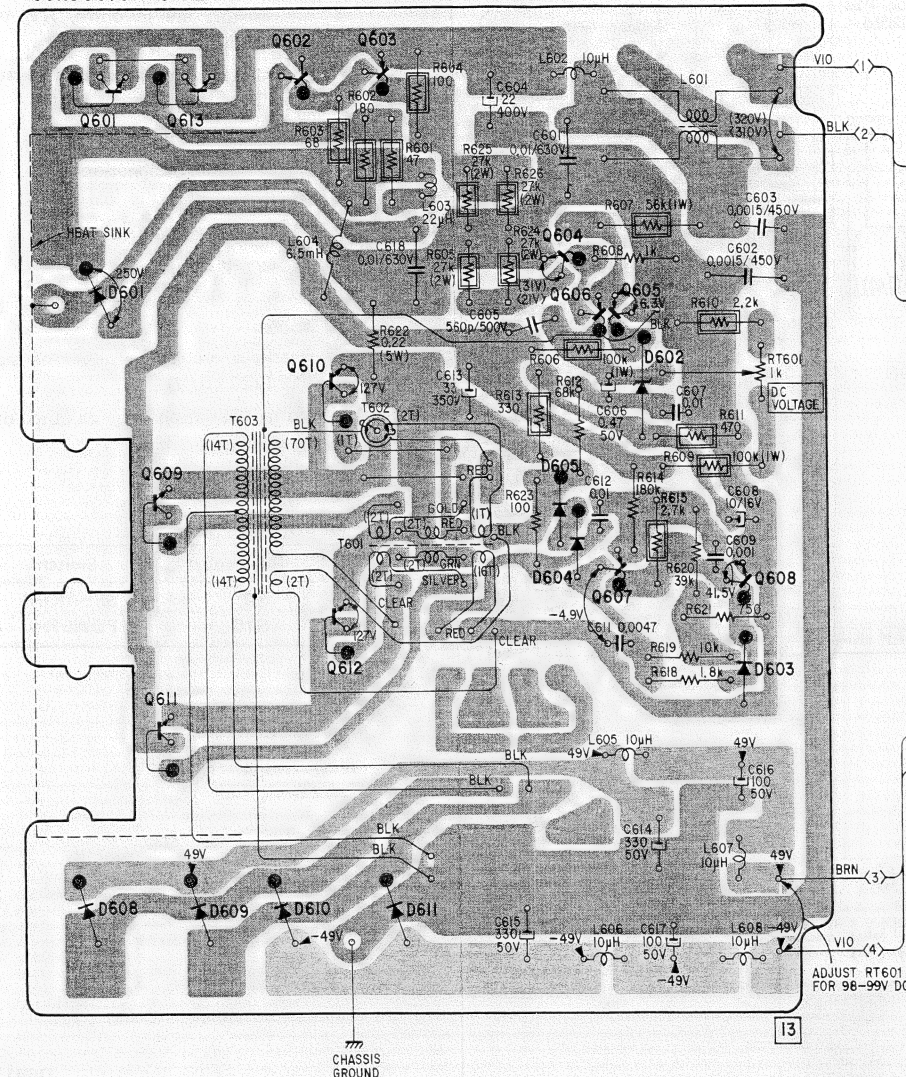




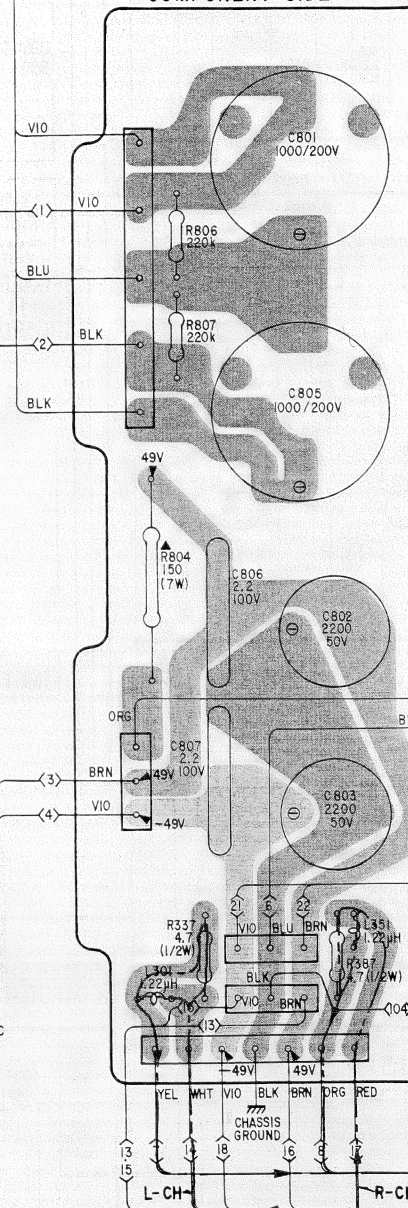
#### 4-6. POWER AMP SECTION MOUNTING DIAGRAM (AEP, UK, E model)

Q IC	601	613	602	603	604	606	605	608					
	609		610										
	611		612			607							
D	601				605	602			951	804 802	803 801		
	608	609	610	611	604		603			952	902	901	
										953	903		

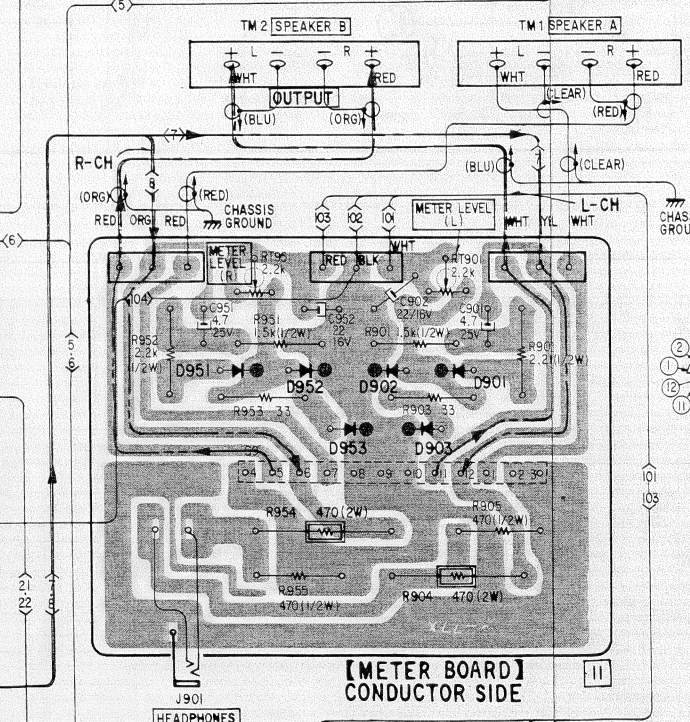
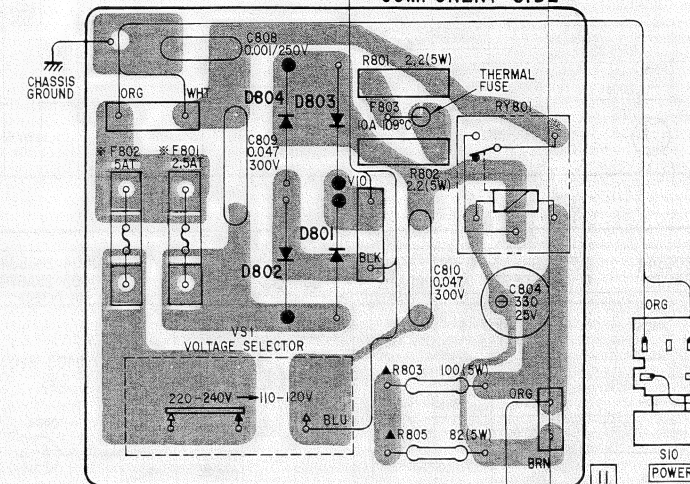
【PULSE-LOCKED POWER SUPPLY BOARD】  
CONDUCTOR SIDE



【POWER SUPPLY (A) BOARD】  
COMPONENT SIDE

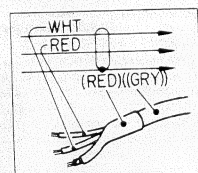


【POWER SUPPLY (B) BOARD】  
COMPONENT SIDE



#### Note:

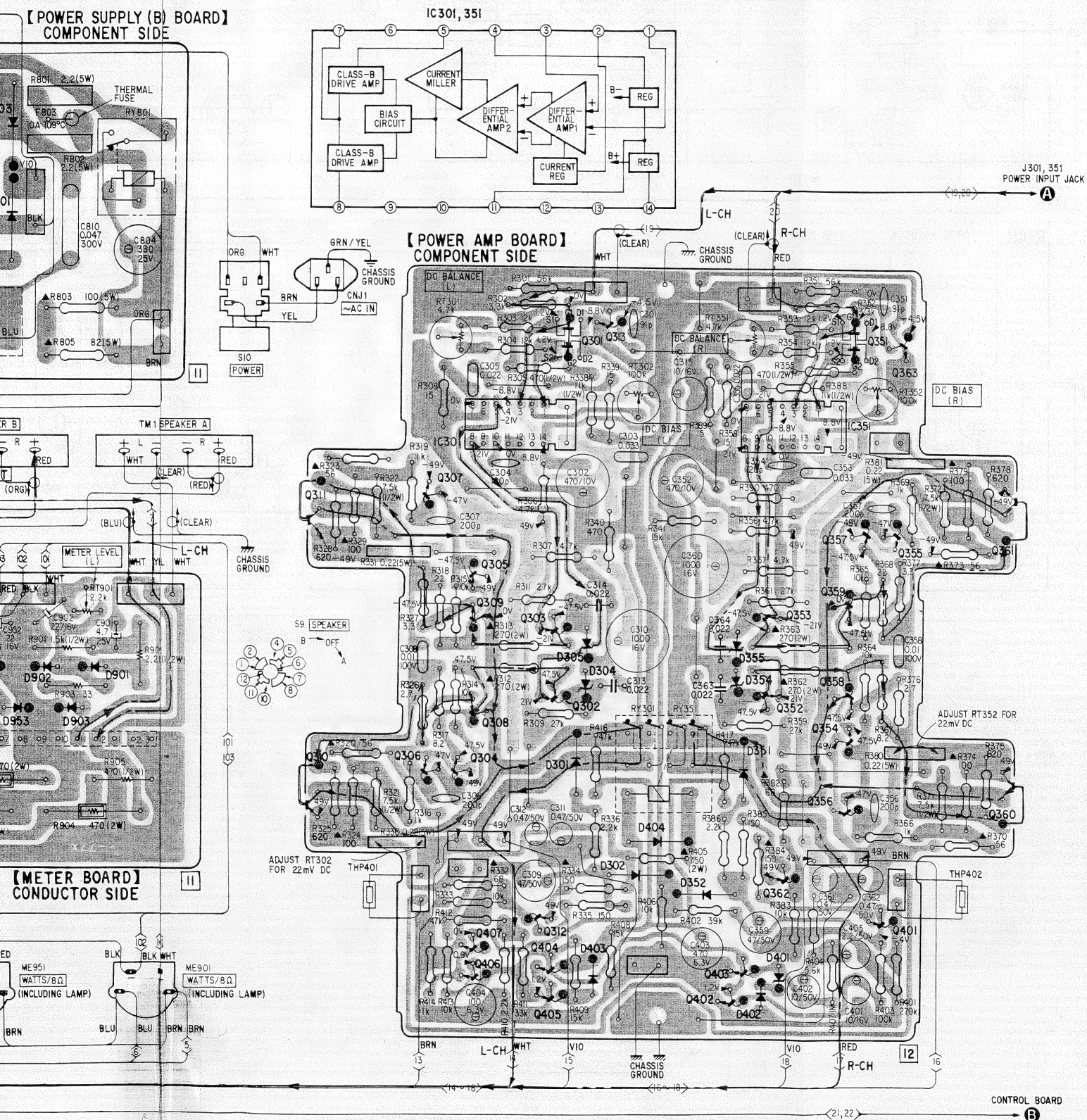
- Color code of sleeving over the end of the jacket.



- : parts extracted from the component side.
- : B+ pattern
- : B- pattern
- Signal Path
  - L-CH
  - R-CH
  - common
- ▲ : nonflammable resistor.

\*  
F801 2.5AT (AEP MODEL: UP TO SERIAL No. 501, 150)  
F802 5AT (UK MODEL: UP TO SERIAL No. 600, 050)  
E MODEL: UP TO SERIAL No. 400, 100/  
F801 3.15AT (AEP MODEL: SERIAL No. 501, 151 AND LATER)  
F802 6.3AT (UK MODEL: SERIAL No. 600, 051 AND LATER)  
E MODEL: SERIAL No. 400, 101 AND LATER/




[illegible]




**TA-F6B**      **TA-F6B**












Note: The components identified by shading and mark  are critical for safety. Replace only with part number specified.

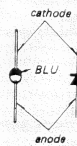
Note: Les composants identifiés par un trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

**Note:**

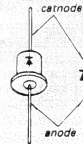
- Components for right channel have same values as for left channel. Reference numbers are coded from 351 or 951.
- All capacitors are in  $\mu\text{F}$  unless otherwise noted.  $\text{pF} = \mu\mu\text{F}$  50 WV or less are not indicated except for electrolytics.
- All resistors are in ohms,  $\frac{1}{4}\text{W}$  unless otherwise noted.  $\text{k}\Omega = 1000\Omega$ ,  $\text{M}\Omega = 1000\text{k}\Omega$
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
-  : direct connection to points marked  on the chassis.
-  : nonflammable resistor.
-  : panel designation
-  : B+ bus.
-  : adjustment for repair.
-  : B- bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no signal conditions with a VOM (20  $\text{k}\Omega/\text{V}$ ).  
( ) : 120 V AC input  
< > : 240 V AC input
- Voltage variations may be noted due to normal production tolerances.
- Switch

Ref. No.	Switch	Position
S9	SPEAKER	B
S10-1, 2	POWER	OFF
VS1	VOLTAGE SELECTOR	220-240 V

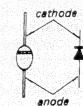
D403: MV12N



D601, 608-611: S34



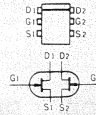
D801-804: U05G (U05E)



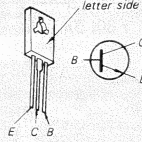
**Replacement Semiconductors**

For replacement, use semiconductors except in ( ).

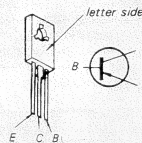
Q301, 351: 2SK58



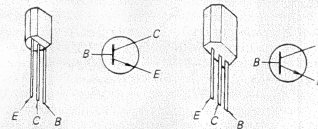
Q302, 352: 2SD668



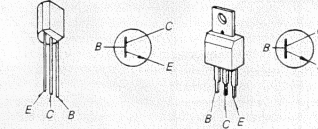
Q303, 353: 2SB648



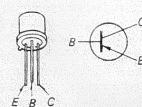
Q304, 307  
Q313, 354  
Q355, 363  
Q402-404  
Q406, 407 } 2SC1364 (2SC634A)



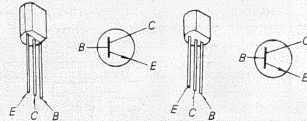
Q602, 604: 2SC1775F (2SC1810)



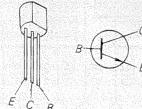
Q603: 2SA911



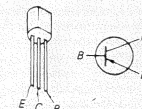
Q608: 2SC1775F (2SC1890)



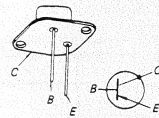
Q309, 359: 2SD667



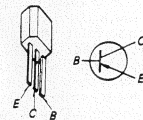
Q308, 358: 2SB647  
Q607: 2SA639S (2SA893)



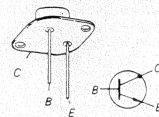
Q310, 360: 2SB655



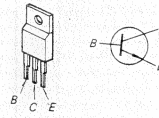
Q305, 306, 312  
Q356, 357, 362 } 2SA678  
Q401, 405



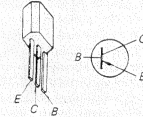
Q311, 361: 2SD675



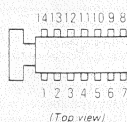
Q601, 613: 2SC2023-R  
Q609-612: 2SC2023-R  
2SC2023-O } (2SC2023)



Q605, 606: 2SA678 (2SA844)

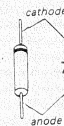


IC301, 351: CX171



D301, 302, 351, 352  
D402, 404, 603-605 } 1S1555  
D903, 953

D602: RD5.6E (RD5.6E-B)  
D901, 902: 1T22AM (1T22)  
D951, 952



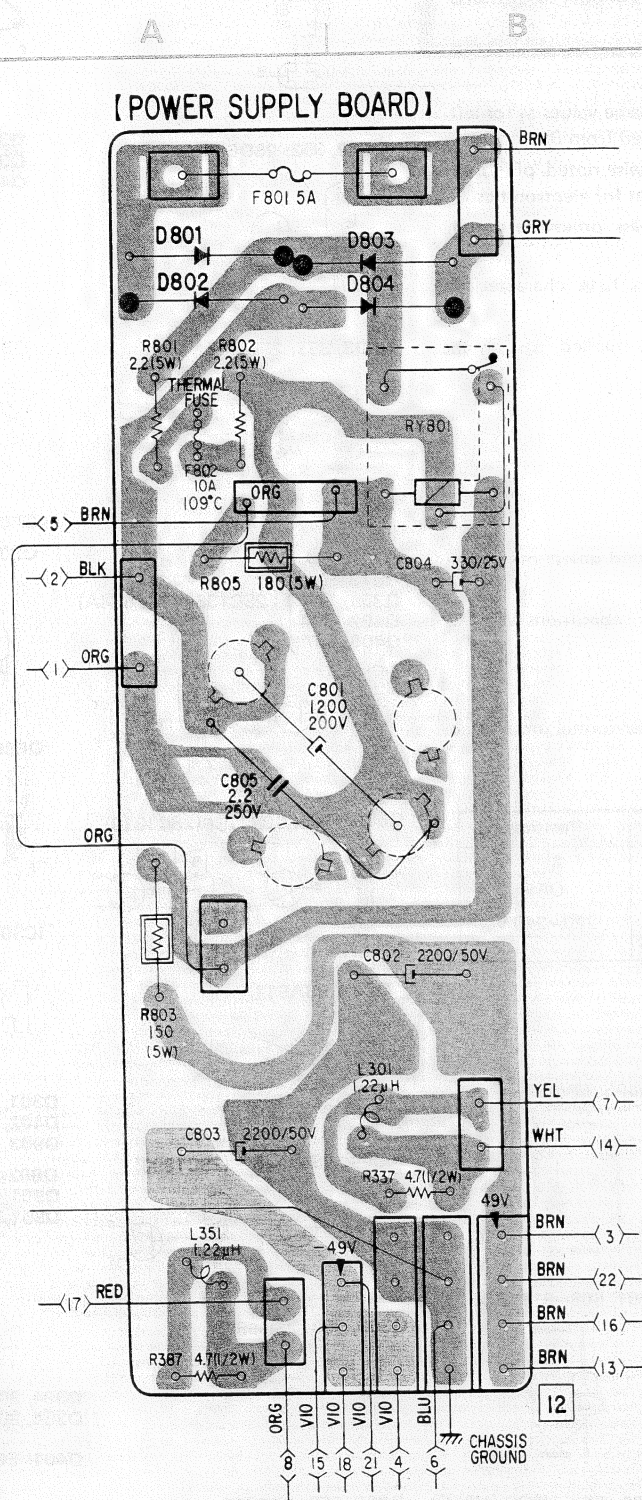
D304, 305: EQB01-21 (EQA01-21R)  
D354, 355

D401: EQB01-07 (EQA01-07)










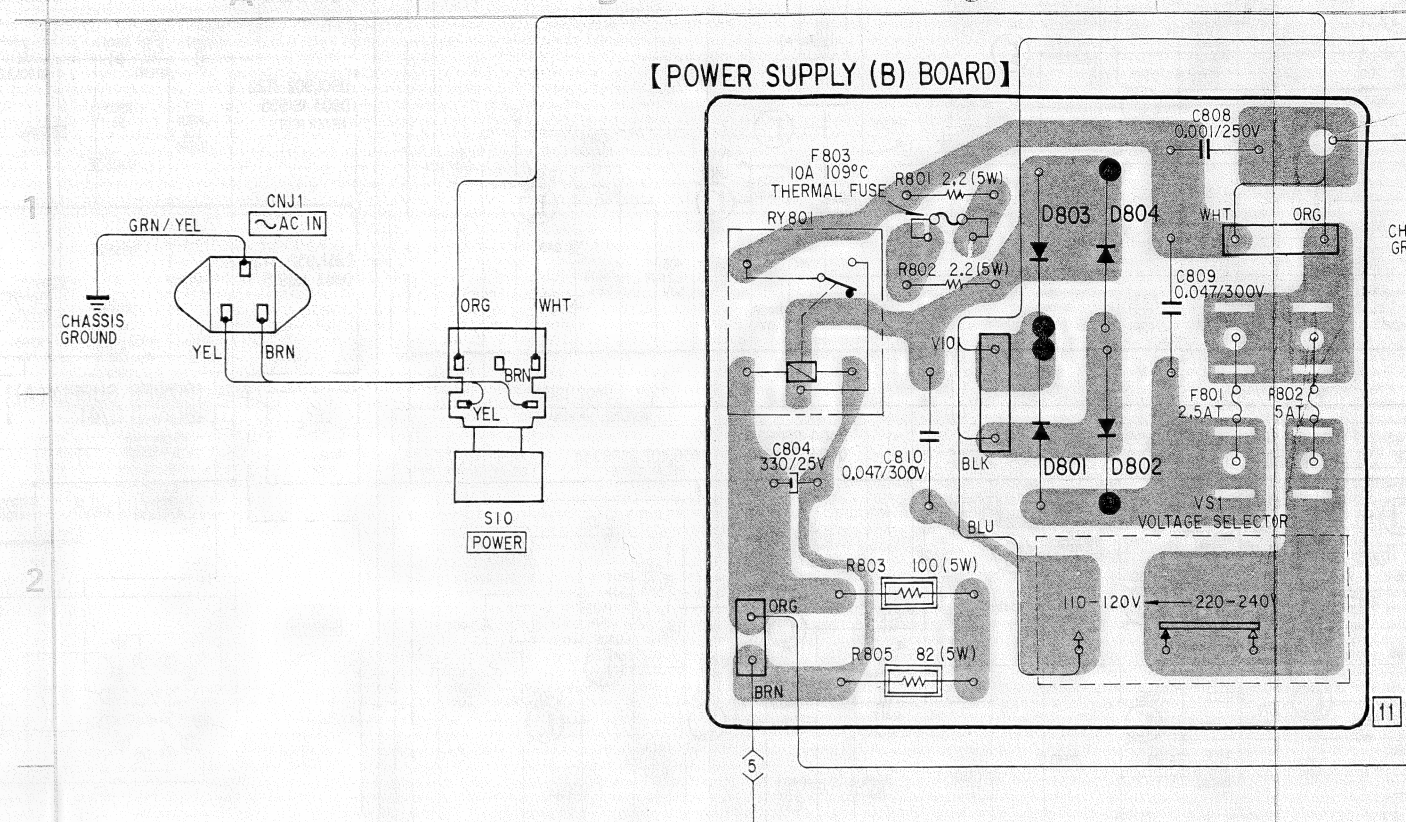
#### 4-8. POWER SUPPLY BOARD MOUNTING DIAGRAM — Conductor Side — (US, Canadian model)



**Note:**

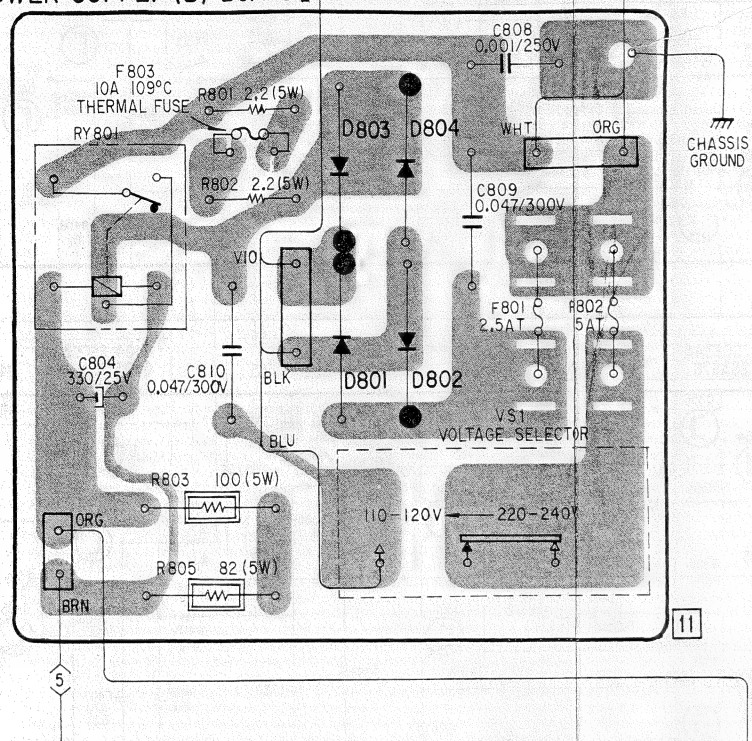
-  : parts extracted from the component side.
-  : B+ pattern
-  : B- pattern
-  : direct connection to points marked  on the chassis.

#### 4-9. POWER SUPPLY BOARD MOUNTING DIAGRAM — Conductor Side — (AEP, UK, E model)

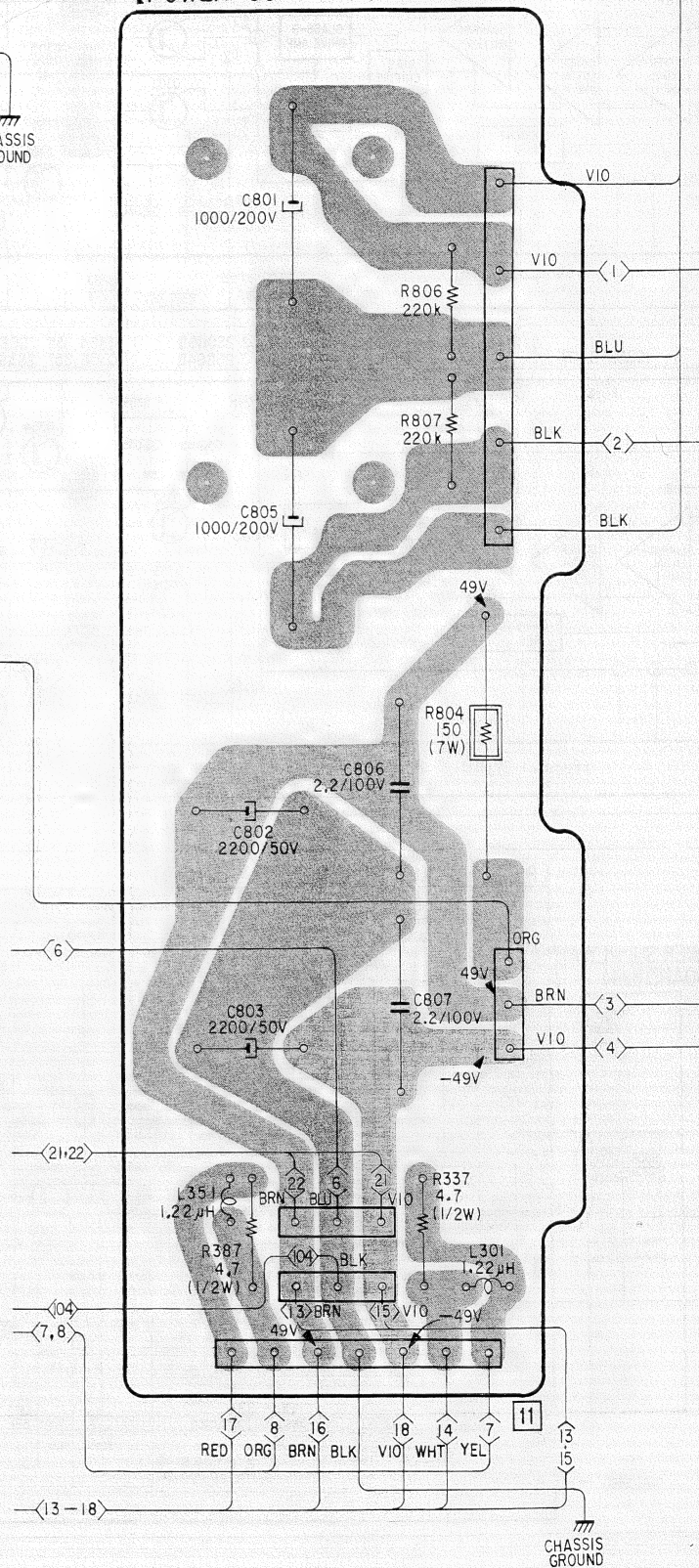




POWER SUPPLY (B) BOARD

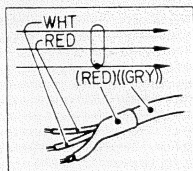





POWER SUPPLY (A) BOARD

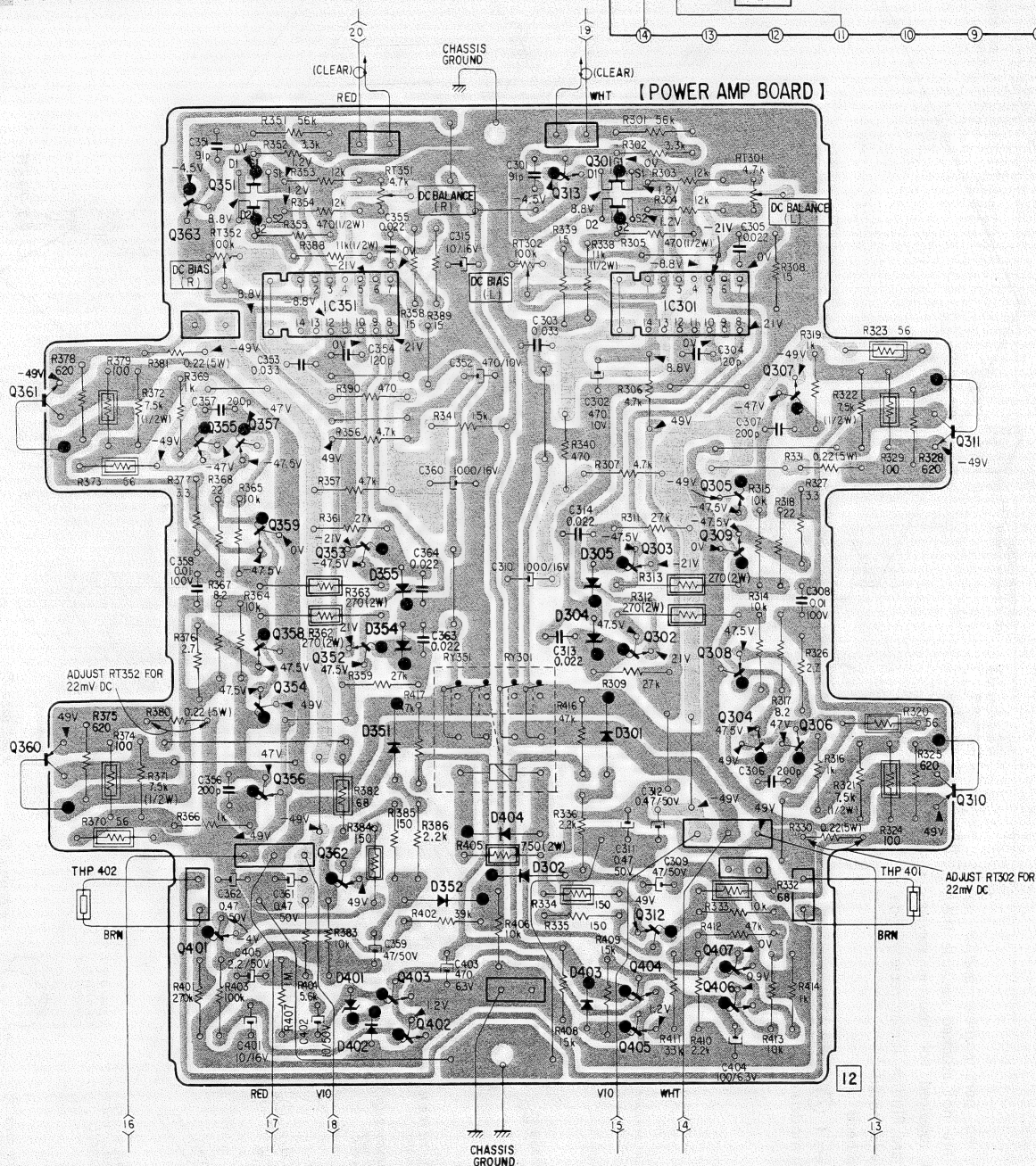
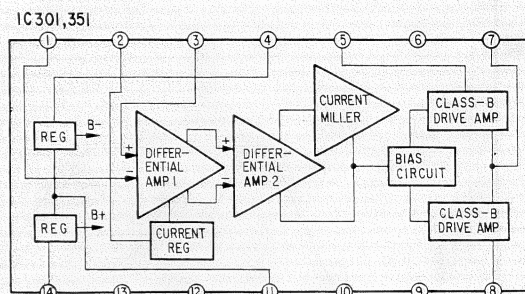




- Color code of sleeving over the end of the jacket.



-  : parts extracted from the component side.
-  : B+ pattern
-  : B- pattern



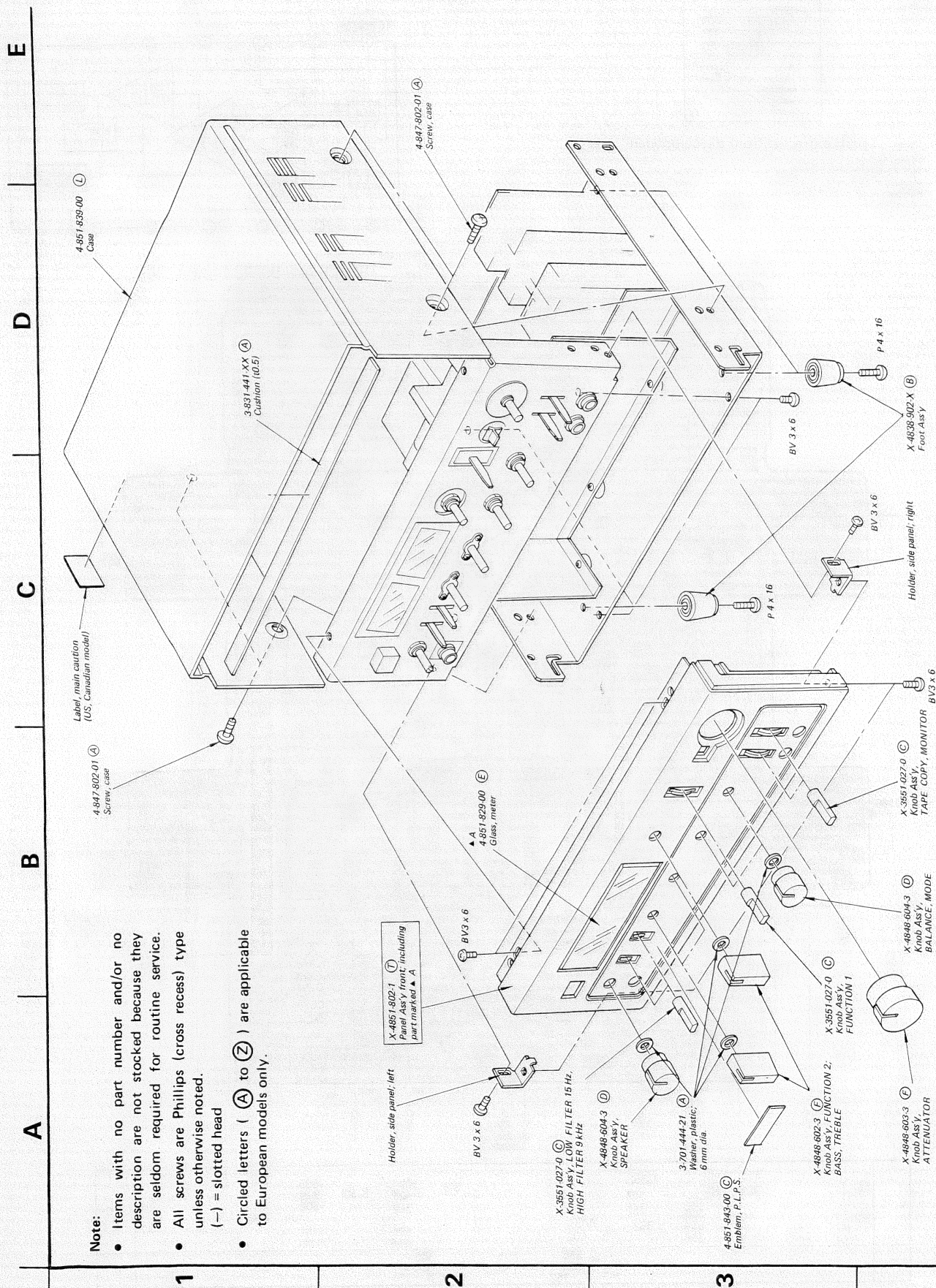
Q, IC	361	363 355	351 357	IC351 353		313	301 303	IC301	305 309 308	307		311	Q, IC
	360		401	359 358 354 356	352		302	312	304	306		310	
				362		403 402	404 405		407 406				
D				401 402	351 354 352	404 302	305 304 301						D




## SECTION 5

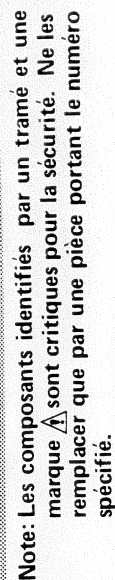
### EXPLODED VIEWS

**5-1.**





**Note:** The components identified by shading and mark  are critical for safety. Replace only with part number specified.



- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.  
(—) = slotted head
- Circled letters ( **A** to **Z** ) are applicable to European models only.



5-3.

E

D

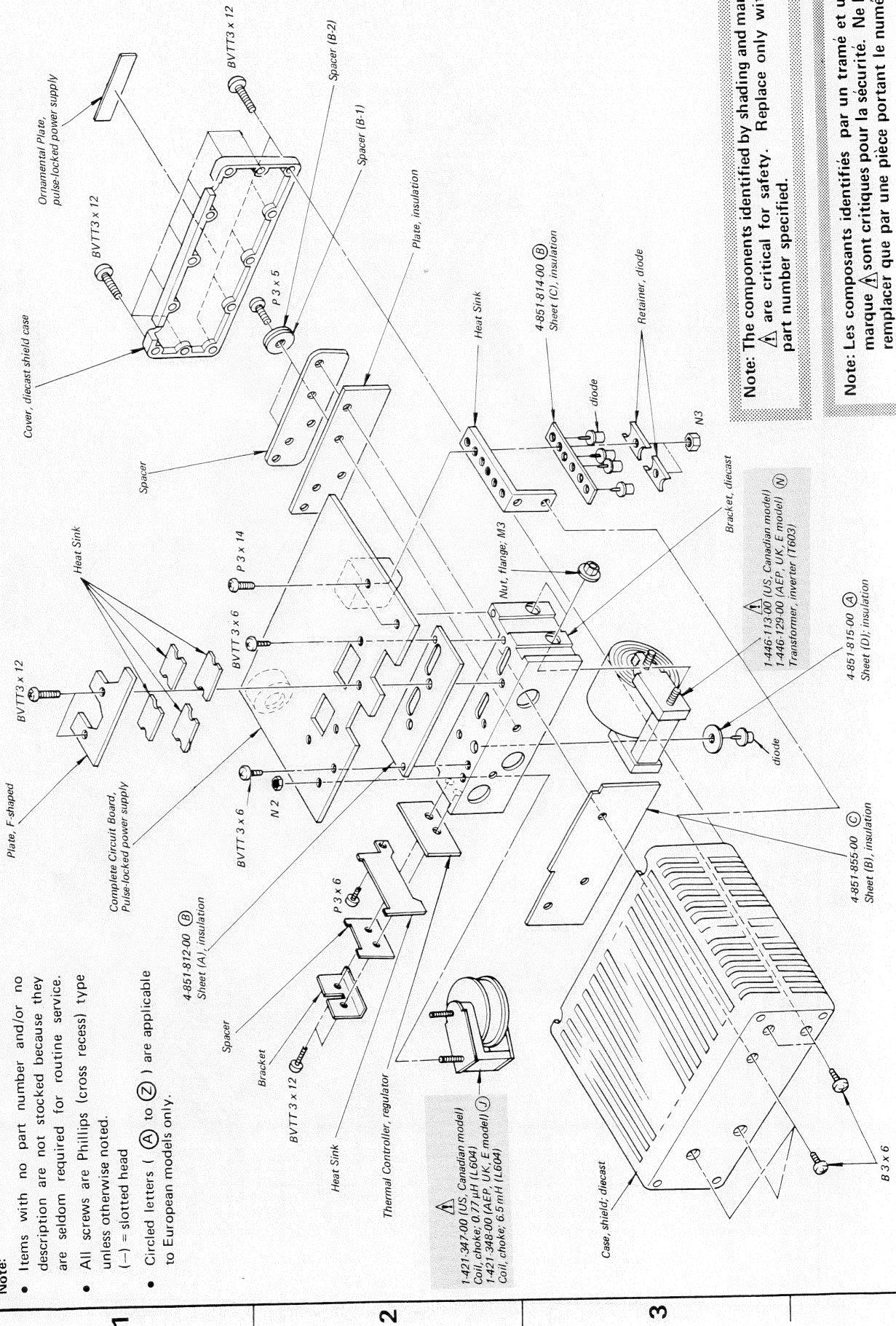
C

B

A

Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
- Circled letters (A) to (Z) are applicable to European models only.



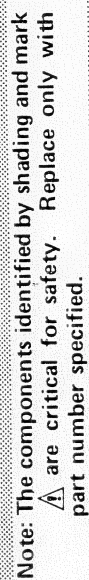
Note: The components identified by shading and mark A are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un trame et une marque A sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.



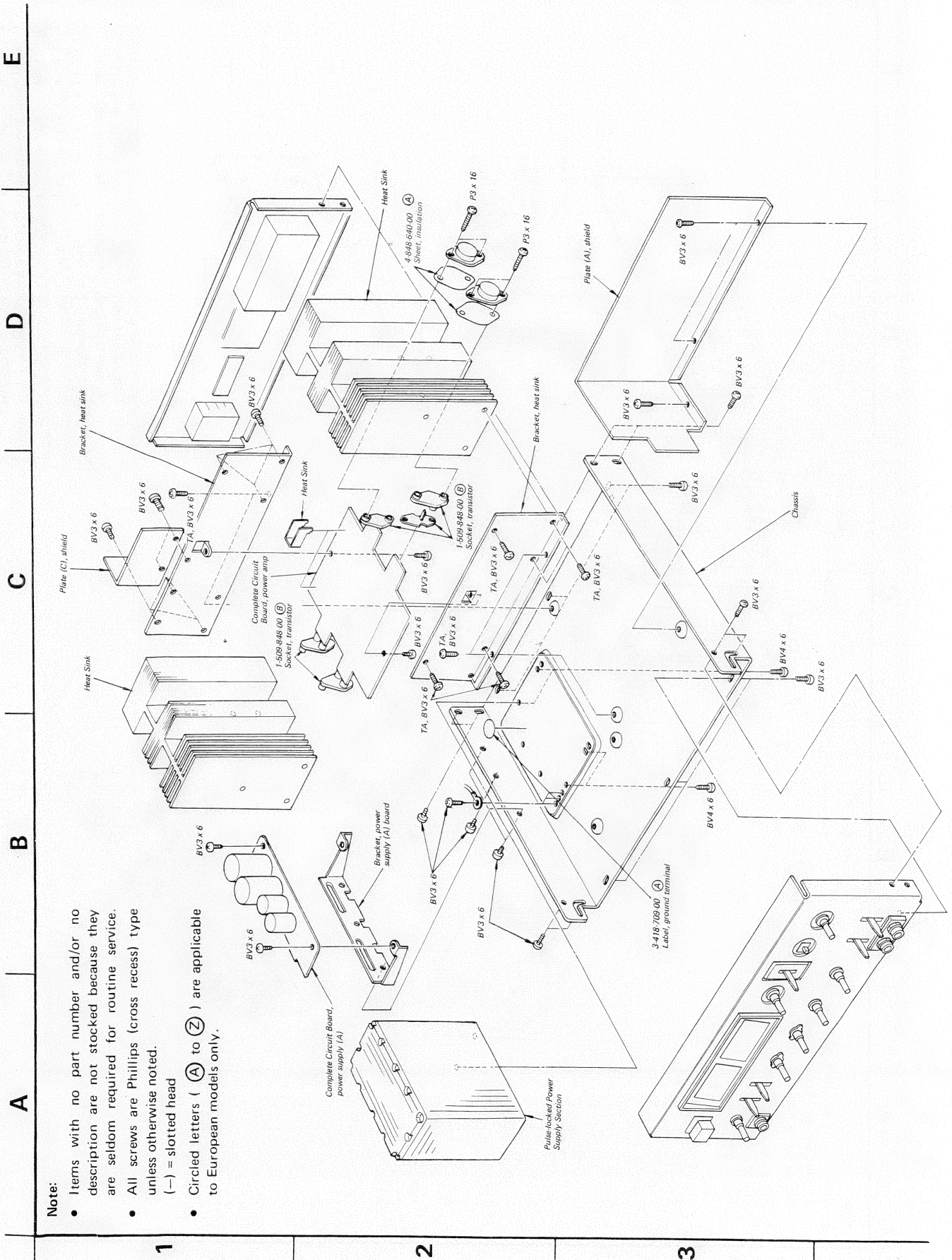
**Note:**

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.  
(—) = slotted head



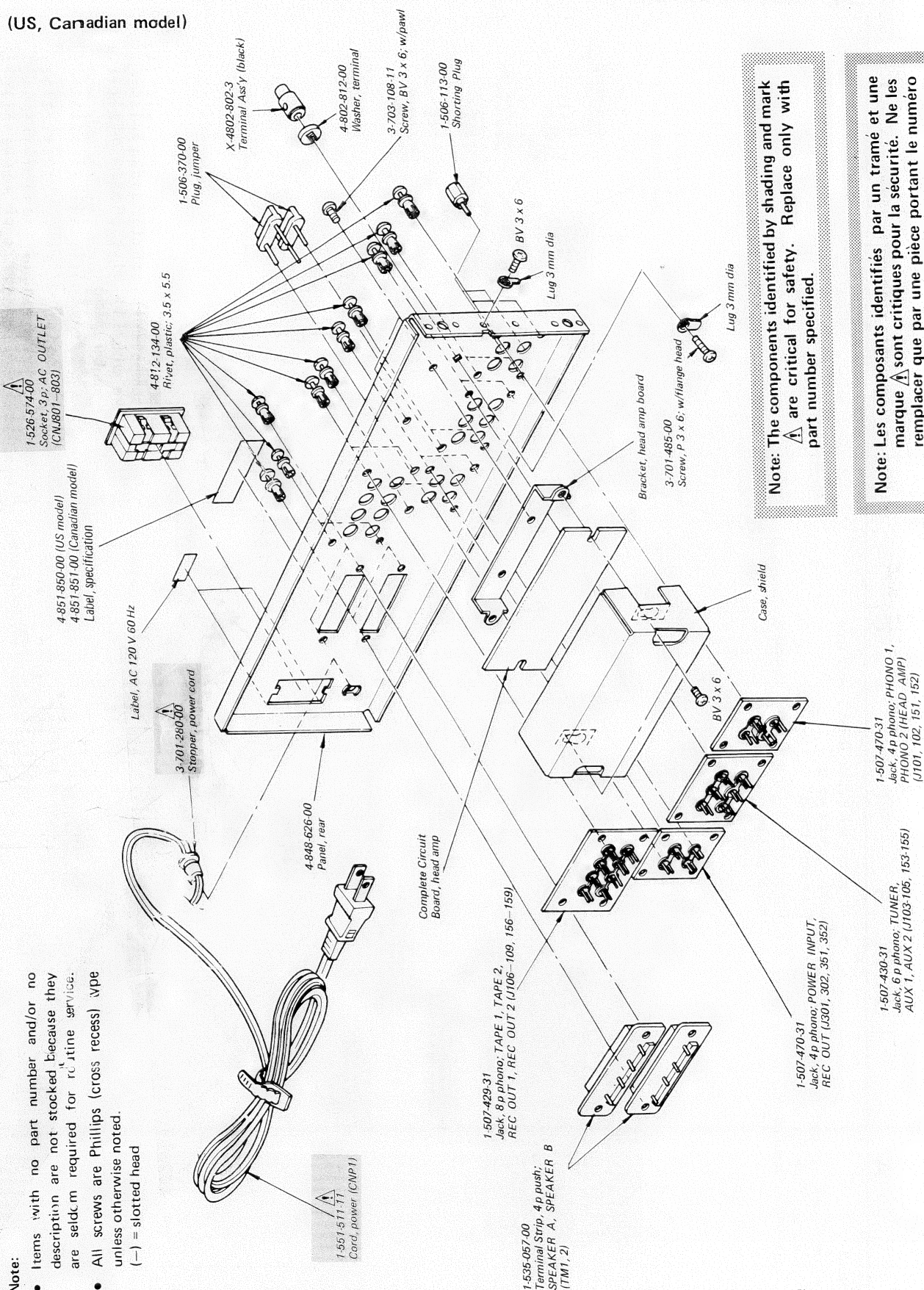


## 5-5. (AEP, UK, E model)





5-6. (US, Canadian model)

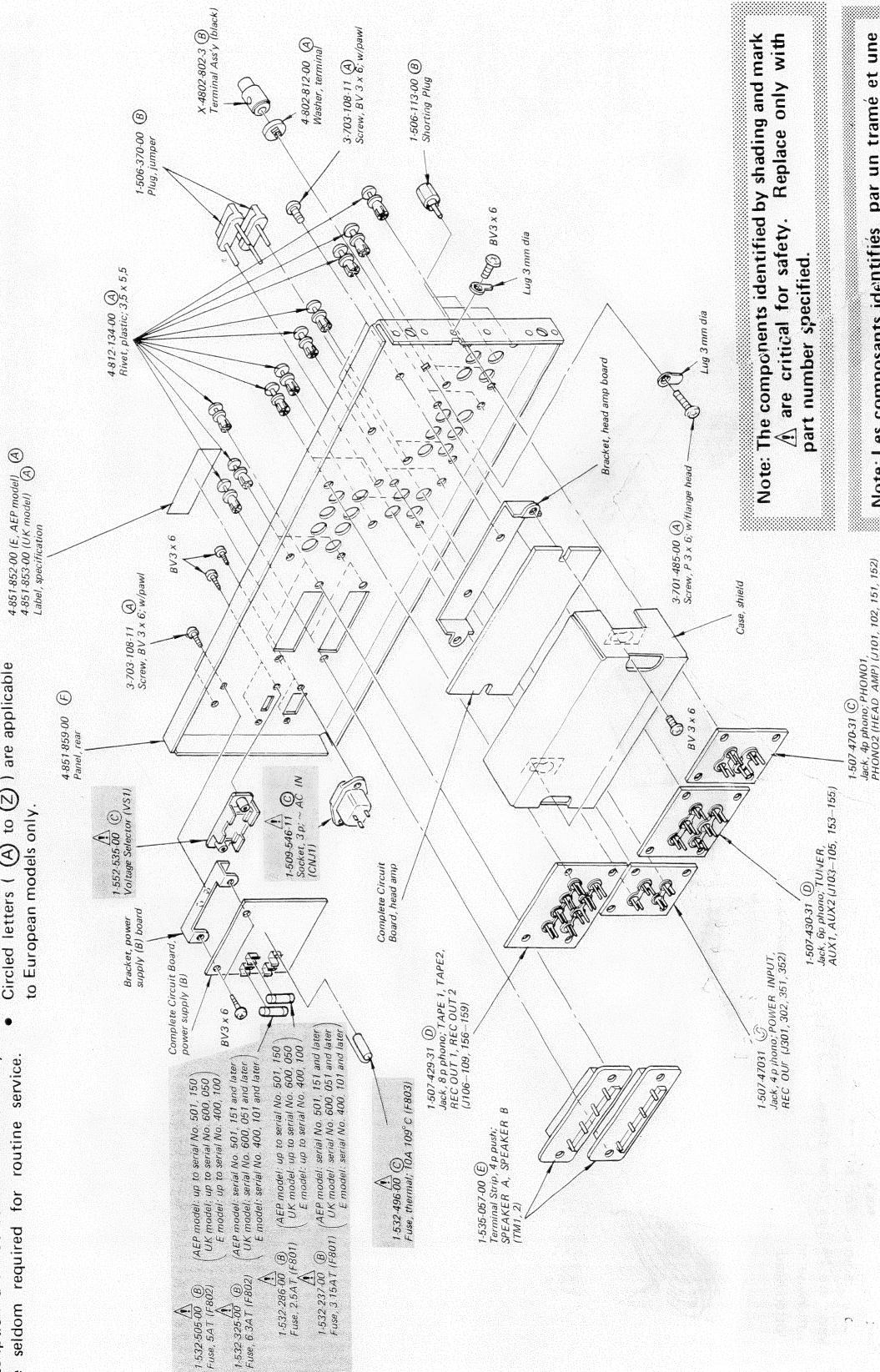





5-7. (AEP, UK, E model)

**Note:**

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
  - Circled letters ( **A** to **Z** ) are applicable to European models only.
- (—) = slotted head  
 (—) = otherwise noted.



**Note:** The components identified by shading and mark  are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un tréma et une marque  $\Delta$  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.



## SECTION 6

## ELECTRICAL PARTS LIST

Note: Circled letters (A) to (Z) are applicable to European models only.


Ref. No.    Part No.    Description

## SEMICONDUCTORS

















## Transistors

Q101, 151	8-765-342-10	(E)	2SK97
⇒ Q102, 152	8-729-387-28	(B)	2SA872E
⇒ Q103, 153			
⇒ Q104, 154	8-722-384-01	(C)	2SK23A-840 (blue)
Q105, 155	8-729-203-04	(B)	2SK30A
⇒ Q106, 156	8-729-387-28	(B)	2SA872E
⇒ Q107, 157	8-723-304-00	(B)	2SK43-4
⇒ Q108, 158	8-729-387-28	(B)	2SA872E
⇒ Q109, 159	8-729-377-58	(B)	2SC1775E
Q110, 160	8-729-366-71	(B)	2SD667
Q111, 161	8-729-364-71	(B)	2SB647
⇒ Q112, 162	8-723-304-00	(B)	2SK43-4
Q301, 351	8-761-510-06	(F)	2SK58
Q302, 352	8-729-366-81	(C)	2SD668
Q303, 353	8-729-364-81	(C)	2SB648
⇒ Q304, 354	8-729-663-47	(B)	2SC1364
Q305	8-727-788-00	(B)	2SA678
⇒ Q 355	8-729-663-47	(B)	2SC1364
Q306, 356	8-727-788-00	(B)	2SA678
⇒ Q307	8-729-663-47	(B)	2SC1364
Q 357	8-727-788-00	(B)	2SA678
Q308, 358	8-729-364-71	(B)	2SB647
Q309, 359	8-729-366-71	(B)	2SD667
Q310, 360	8-729-365-53	(I)	2SB655
Q311, 361	8-729-367-53	(G)	2SD675
Q312, 362	8-727-788-00	(B)	2SA678
⇒ Q313, 363	8-729-663-47	(B)	2SC1364
Q401	8-727-788-00	(B)	2SA678
⇒ Q402-404	8-729-663-47	(B)	2SC1364
Q405	8-727-788-00	(B)	2SA678
⇒ Q406, 407	8-729-663-47	(B)	2SC1364
⇒ Q501, 502	8-727-314-00	(C)	2SK42-4
Q503	8-729-316-12	(C)	2SC1061
⇒ Q504, 505	8-729-377-59	(B)	2SC1775F
⇒ Q506, 507	8-729-163-93	(B)	2SA639S
Q508	8-729-317-12	(C)	2SA671
Q509	8-729-203-04	(B)	2SK30A

⇒ Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

Note: The components identified by shading and mark  are critical for safety. Replace only with part number specified.

Ref. No.    Part No.    Description


⇒ Q510	8-760-413-10	(B)	2SC1475
⇒ Q511, 512	8-729-377-59	(B)	2SC1775F
⇒ Q601	 8-729-308-71	(B)	2SC1986D-R (US, Canadian model)
⇒ Q601	 8-729-302-31	(D)	2SC2023-R (AEP, UK, E model)
Q602	 8-765-170-01		2SC1962 (US, Canadian model)
⇒ Q602	 8-729-377-59	(B)	2SC1775F (AEP, UK, E model)
Q603	 8-765-082-20		2SA896 (US, Canadian model)
Q603	 8-765-141-00	(H)	2SA911 (AEP, UK, E model)
Q604	 8-765-012-20		2SC1811 (US, Canadian model)
⇒ Q604	 8-729-377-59	(B)	2SC1775F (AEP, UK, E model)
⇒ Q605, 606	 8-727-788-00	(B)	2SA678
⇒ Q607	 8-729-163-93	(B)	2SA639S
⇒ Q608	 8-729-377-59	(B)	2SC1775F
⇒ Q609-612	 8-729-308-72		2SC1986D-O (US, Canadian model)
⇒ Q609-612	 8-729-302-31	(D)	2SC2023-R
	 8-729-302-32	(D)	2SC2023-O (AEP, UK, E model)
⇒ Q613	 8-729-308-71		2SC1986D-R (US, Canadian model)
⇒ Q613	 8-729-302-31	(D)	2SC2023-R (AEP, UK, E model)
⇒ Q701, 751	8-761-710-00	(B)	2SC1637-1
⇒ Q704, 754			
⇒ Q705, 755	8-729-387-28	(B)	2SA872E
⇒ Q706, 756			

## ICs

IC201, 251	8-759-314-57	(C)	HA1457
IC301, 351	8-751-710-00	(G)	CX171

## Diodes

D101, 151	8-719-912-00	(B)	MV12N
⇒ D102, 152	8-719-931-26	(B)	EQB01-26
⇒ D103, 153			
⇒ D201, 251	8-719-931-21	(B)	EQB01-21
⇒ D202, 252			
D301, 351	8-719-815-55	(A)	1S1555
D302, 352			
⇒ D304, 354	8-719-931-21	(B)	EQB01-21
⇒ D305, 355			
⇒ D401	8-719-931-07	(B)	EQB01-07
D402	8-719-815-55	(A)	1S1555
D403	8-719-912-00	(B)	MV12N
D404	8-719-815-55	(A)	1S1555

Note: Les composants identifiés par un trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.



Ref. No.	Part No.	Description
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D601	8-719-303-41	S34
⇒ D602	8-719-156-08	RD5.6E
D603-605	8-719-815-55	1S1555
D608-611	8-719-303-41	S34
⇒ D801-804	8-719-811-55	U05G
⇒ D901, 951		
⇒ D902, 952	8-719-422-21	1T22AM
D903, 953	8-719-815-55	1S1555

## MISCELLANEOUS

THP401, 402 1-800-427-00 (B) Thermistor, positive

## COILS

L301, 351	1-420-838-00	1.22 $\mu$ H
L601	1-421-349-00	Line Filter (AEP, UK, E model)
L601	1-421-259-00	Line Filter (US, Canadian model)
L602	1-421-329-00	Choke, 10 $\mu$ H
L603	1-407-161-XX	Microinductor, 22 $\mu$ H
L604	1-421-347-00	Choke, 0.77 $\mu$ H (US, Canadian model)
L604	1-421-348-00	Choke, 6.5 mH (AEP, UK, E model)
L605-608	1-421-329-00	Choke, 10 $\mu$ H


## TRANSFORMERS

T601	1-543-098-00	Core (yellow)
T601	1-543-100-00	Core (blue)
T602	1-543-121-00	Core
T603	1-446-113-00	Inverter (US, Canadian model)
T603	1-446-129-00	Inverter (AEP, UK, E model)

## CAPACITORS

All capacitors are in  $\mu$ F and ceramic unless otherwise noted.  
50 WV or less are not indicated except for electrolytics.  
p :  $\mu$ F, elect : electrolytic


C101, 151	1-102-963-00	33 p
C102, 152	1-102-129-00	0.01
C103, 153	1-102-115-00	560 p
C104, 154	1-130-125-00	0.016 100 V polyethylene
C105, 155	1-130-126-00	0.056 100 V polyethylene

Note: The components identified by shading and mark  are critical for safety. Replace only with part number specified.

Note: Circled letters (A to Z) are applicable to European models only.

Ref. No.	Part No.	Description
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C106, 156	1-102-973-00	100 p
C107, 157	1-131-417-00	3.3 16 V tantalum
C108, 158	1-102-963-00	33 p
C109, 159	1-121-413-00	100 6.3 V elect
C111, 161	1-121-396-00	4.7 50 V elect
C112, 162		
C113, 163	1-130-133-00	0.056 100 V polyethylene
C114, 164	1-121-352-00	47 10 V elect
C115, 165	1-121-261-00	220 35 V elect
C116, 166		
C201, 251	1-121-450-00	2.2 50 V elect
C202, 252	1-102-945-00	8 p
C203, 253	1-102-808-00	6 p
C204, 254	1-102-934-00	1 p
C205, 255	1-121-411-00	47 50 V elect
C206, 256	1-121-396-00	4.7 50 V elect
C207, 257	1-101-059-00	510 p
C208, 258	1-102-979-00	240 p
C209, 259	1-108-581-00	0.012 mylar
C210, 260	1-108-585-00	0.018 mylar
C211, 261	1-108-607-00	0.15 mylar
C212, 262	1-108-585-00	0.018 mylar
C213, 263	1-131-347-00	1 25 V tantalum
C214, 264	1-121-450-00	2.2 50 V elect
C215, 265	1-130-133-00	0.056 100 V polyethylene
C216, 266	1-121-396-00	4.7 50 V elect
C217, 267	1-130-133-00	0.056 100 V polyethylene
C218, 268	1-121-416-00	100 25 V elect
C219, 269		
C301, 351	1-102-972-00	91 p
C302, 352	1-121-425-00	470 10 V elect
C303, 353	1-108-591-00	0.033 mylar
C304, 354	1-102-816-00	120 p
C305, 355	1-108-587-00	0.022 mylar
C306, 356	1-102-977-00	200 p
C307, 357		
C308, 358	1-108-377-00	0.01 100 V mylar
C309, 359	1-121-411-00	47 50 V elect
C310, 360	1-121-245-00	1000 16 V elect
C311, 361	1-121-726-00	0.47 50 V elect
C312, 362		

Note: Les composants identifiés par un trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.



**Note:** Circled letters (A to Z) are applicable to European models only.

Ref. No.	Part No.	Description
C313, 363 C314, 364	1-101-924-00 (A) 0.022	
C315	1-121-651-00 (A) 10	16 V elect
C401	1-121-651-00 (A) 10	16 V elect
C402	1-121-738-00 (A) 10	50 V elect
C403	1-121-424-00 (B) 470	6.3 V elect
C404	1-121-413-00 (A) 100	6.3 V elect
C405	1-121-450-00 (A) 2.2	50 V elect
C501, 502	1-102-978-00 (A) 220 p	
C503, 504	1-121-480-00 (A) 22	25 V elect
C505, 506	1-121-261-00 (B) 220	35 V elect
C507, 508	1-101-880-00 (A) 47 p	
C509	1-121-396-00 (A) 4.7	50 V elect
C510	1-102-978-00 (A) 220 p	
C511	1-121-480-00 (A) 22	25 V elect
C512	1-121-736-00 (B) 1000	10 V elect

C601	△ 1-130-141-00 (A) 0.01	630 V polyethylene
C602, 603	△ 1-102-070-00 0.001	150 V (US, Canadian model)
C602, 603	△ 1-115-149-00 (C) 0.0015	450 V paper (AEP, UK, E model)
C604	△ 1-123-401-00 47	200 V elect (US, Canadian model)
C604	△ 1-123-402-00 (C) 22	400 V elect (AEP, UK, E model)
C605	△ 1-161-438-00 (A) 560 p	500 V
C606	△ 1-121-726-00 (A) 0.47	50 V elect
C607	△ 1-108-239-00 (A) 0.01	mylar
C608	△ 1-121-651-00 (A) 10	16 V elect
C609	△ 1-108-227-00 (A) 0.01	mylar
C611	△ 1-108-234-00 (A) 0.0047	mylar
C612	△ 1-108-239-00 (A) 0.01	mylar
C613	△ 1-123-277-00 68	160 V elect (US, Canadian model)
C613	△ 1-123-280-00 (C) 33	350 V elect (AEP, UK, E model)
C614, 615	△ 1-121-656-00 (B) 330	50 V elect
C616, 617	△ 1-121-417-00 (B) 100	50 V elect
C618	△ 1-130-141-00 (A) 0.01	630 V polyethylene

**Note:** The components identified by shading and mark △ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description
C701, 751	1-131-429-00 (F) 470	3.15 V tantalum
C702, 752	1-130-127-00 (B) 0.015	100 V polyethylene
C703, 753	1-102-074-00 (A) 0.001	
C704, 754	1-102-823-00 (A) 430 p	
C705, 755	1-101-880-00 (A) 47p	
C706, 756	1-101-059-00 (A) 510 p	
C707, 757 C708, 758	1-121-751-00 (B) 330	6.3 V elect
C709, 759	1-130-127-00 (B) 0.015	100 V polyethylene
C710, 760	1-131-377-00 (B) 10	10 V tantalum
C711, 761	1-121-420-00 (B) 220	10 V elect
C801	△ 1-125-180-00 1200	200 V elect (US, Canadian model)
C801	△ 1-125-179-00 (I) 1000	200 V elect (AEP, UK, E model)
C802, 803	1-123-256-00 (D) 2200	50 V elect
C804	1-121-654-00 (B) 230	25 V elect
C805	△ 1-130-090-00 2.2	250 V polyethylene (US, Canadian model)
C805	△ 1-125-179-00 (I) 1000	200 V elect (AEP, UK, E model)
C806, 807	1-130-084-00 (D) 2.2	100 V polyethylene (AEP, UK, E model)
C808	△ 1-102-222-00 (B) 1000 p	250 V (AEP, UK, E model)
C809, 810	△ 1-108-749-00 (B) 0.047	300 V mylar (AEP, UK, E model)
C901, 951	1-121-395-00 (A) 4.7	25 V elect
C902, 952	1-121-479-00 (A) 22	16 V elect

## RESISTORS

All resistors are in ohms. Common ¼ W carbon resistors are omitted. Refer to the list on page 49 for their part numbers. All variable and adjustable resistors have characteristic curve B, unless otherwise noted.  
kΩ : 1000 Ω

R101, 151	1-244-914-00 (A) 51 k	½ W carbon
R106, 156	1-244-849-00 (A) 100	½ W carbon
R110, 160	1-214-148-00 (A) 4.7 k	¼ W metal oxide 1 %
R111, 161	1-214-174-00 (A) 56 k	¼ W metal oxide 1 %
R122, 172	1-244-857-00 (A) 220	½ W carbon


**Note:** Les composants identifiés par un trame et une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.




Note: Circled letters (A to Z) are applicable to European models only.

Ref. No.	Part No.	Description
R305, 355	1-244-865-00 (A) 470	½ W carbon
R312, 362	(A) 1-206-650-00 (A) 270	2 W metal oxide (nonflammable)
R313, 363	(A) 1-211-516-00 (B) 56	¼ W carbon (nonflammable)
R320, 370	(A) 1-211-516-00 (B) 56	¼ W carbon (nonflammable)
R321, 371	1-244-894-00 (A) 7.5 k	½ W carbon
R322, 372	(A) 1-211-516-00 (B) 56	¼ W carbon (nonflammable)
R323, 373	(A) 1-211-516-00 (B) 56	¼ W carbon (nonflammable)
R324, 374	(A) 1-211-522-00 (C) 100	¼ W carbon (nonflammable)
R329, 379	(A) 1-211-522-00 (C) 100	¼ W carbon (nonflammable)
R330, 380	1-217-156-00 (A) 0.22	5 W wirewound
R331, 381	(A) 1-211-518-00 (C) 68	¼ W carbon (nonflammable)
R332, 382	(A) 1-211-518-00 (C) 68	¼ W carbon (nonflammable)
R334, 384	(A) 1-211-526-00 (C) 150	¼ W carbon (nonflammable)
R337, 387	1-244-817-00 (A) 4.7	½ W carbon
R405	(A) 1-206-661-00 (A) 750	2 W metal oxide (nonflammable)
R501, 508	(A) 1-206-483-00 (A) 68	2 W metal oxide (nonflammable)
R514	1-244-859-00 (A) 270	½ W carbon
R601	(A) 1-211-490-00 4.7	¼ W carbon (nonflammable) (US, Canadian model)
R601	(A) 1-211-514-00 (A) 47	¼ W carbon (nonflammable) (AEP, UK, E model)
R602	(A) 1-211-498-00 10	¼ W carbon (nonflammable) (US, Canadian model)
R602	(A) 1-211-528-00 (A) 180	¼ W carbon (nonflammable) (AEP, UK, E model)
R603	(A) 1-211-514-00 47	¼ W carbon (nonflammable) (US, Canadian model)
R603	(A) 1-211-518-00 (C) 68	¼ W carbon (nonflammable) (AEP, UK, E model)

Ref. No.	Part No.	Description
R604	(A) 1-211-528-00 180	¼ W carbon (nonflammable) (US, Canadian model)
R604	(A) 1-211-522-00 (C) 100	¼ W carbon (nonflammable) (AEP, UK, E model)
R605	(A) 1-214-596-00 39 k	2 W metal oxide (nonflammable) (US, Canadian model)
R605	(A) 1-206-698-00 (A) 27 k	2 W metal oxide (nonflammable) (AEP, UK, E model)
R606	(A) 1-244-915-00 56 k	½ W carbon (US, Canadian model)
R606	(A) 1-214-595-00 (A) 100 k	1 W metal oxide (nonflammable) (AEP, UK E model)
R607	(A) 1-214-598-00 (A) 56 k	1 W metal oxide (nonflammable)
R608	(A) 1-246-473-00 (A) 1 k	¼ W carbon
R609	(A) 1-244-915-00 56 k	½ W carbon (US, Canadian model)
R609	(A) 1-214-595-00 (A) 100 k	1 W metal oxide (nonflammable) (AEP, UK, E model)
R610	(A) 1-211-945-00 (A) 2.2 k	¼ W carbon (nonflammable)
R611	(A) 1-211-532-00 (C) 270	¼ W carbon (nonflammable)
R612	(A) 1-246-521-00 100 k	¼ W carbon (US, Canadian model)
R612	(A) 1-246-519-00 (A) 68 k	¼ W carbon (AEP, UK, E model)
R613	(A) 1-211-534-00 (C) 330	¼ W carbon (nonflammable)
R614	(A) 1-246-519-00 68 k	¼ W carbon (US, Canadian model)
R614	(A) 1-244-927-00 (A) 180 k	½ W carbon (AEP, UK, E model)
R615	(A) 1-211-553-00 (A) 2.7 k	¼ W carbon (nonflammable)
R618	(A) 1-246-479-00 (A) 1.8 k	¼ W carbon
R619	(A) 1-246-497-00 (A) 10 k	¼ W carbon

Note: The components identified by shading and mark  are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un tramé et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.



Note: Circled letters (A to Z) are applicable to European models only.

Ref. No.	Part No.	Description
R620	1-246-511-00 (A) 39 k	1/4 W carbon
R621	1-246-469-00 680	1/4 W carbon (US, Canadian model)
R621	1-246-470-00 (A) 750	1/4 W carbon (AEP, UK, E model)
R622	1-217-156-00 (A) 0.22	5 W wirewound
R623	1-246-451-00 120	1/4 W carbon (US, Canadian model)
R623	1-246-449-00 (A) 100	1/4 W carbon (AEP, UK, E model)
R624	1-214-596-00 39 k	2 W metal oxide (nonflammable) (US, Canadian model)
R624-626	1-206-698-00 (A) 27 k	2 W metal oxide (nonflammable) (AEP, UK, E model)
R701, 751	1-244-850-00 (A) 110	1/2 W carbon
R705, 755	1-244-879-00 (A) 1.8 k	1/2 W carbon
R708, 758	1-244-845-00 (A) 68	1/2 W carbon
R709, 759	1-244-809-00 (A) 2.2	1/2 W carbon
R801, 802	1-217-570-00 (B) 2.2	5 W metal oxide
R803	1-217-312-00 150	5 W wirewound (nonflammable) (US, Canadian model)
R803	1-217-310-00 (B) 100	5 W wirewound (nonflammable) (AEP, UK, E model)
R804	1-217-347-00 (B) 150	7 W wirewound (nonflammable) (AEP, UK, E model)
R805	1-217-313-00 180	5 W wirewound (nonflammable) (US, Canadian model)
R805	1-217-309-00 (B) 82	5 W wirewound (nonflammable) (AEP, UK, E model)
R901, 951	1-244-877-00 (A) 1.5 k	1/2 W carbon
R902, 952	1-244-881-00 (A) 2.2 k	1/2 W carbon
R904, 954	1-207-640-00 (B) 470	2 W wirewound (nonflammable)
R905, 955	1-244-865-00 (A) 470	1/2 W carbon

Note: The components identified by shading and mark A are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description
RT301, 351	1-224-251-XX (C) 4.7 k	adjustable; dc balance
RT302, 352	1-224-255-XX (C) 100 k	adjustable; dc bias
RT601	1-224-642-XX (B) 1 k	adjustable; dc voltage
RT901, 951	1-224-489-00 (B) 2.2 k	adjustable; meter level calibration
RV201, 251	1-226-122-00 (K) 100 k/100 k/10 k/10 k	variable; ATTENUATOR
RV205, 255	1-226-120-00 (E) 100 k (N)/100 k (M)	variable; BALANCE
RV202, 252	1-226-120-00 (E) 100 k (A)/100 k (A)	variable; TREBLE
RV203, 253	1-226-121-00 (F) 100 k (C)/100 k (C)	variable; BASS
RV204, 254	1-226-119-00 (F) 100 k (C)/100 k (C)	variable; BASS
SWITCHES		
S1	1-552-238-00 (F) Lever-slide	FUNCTION (1)
S2	1-552-241-00 (I) Rotary	FUNCTION (2)
S3, 4	1-552-237-00 (F) Lever-slide	MONITOR, TAPE COPY
S5	1-552-240-00 (G) Rotary	MODE
S6, 7	1-552-236-00 (D) Lever-slide	HIGH FILTER 9 kHz, LOW FILTER 15 kHz
S8	1-516-962-00 (C) Lever-slide	MUTING
S9	1-552-239-00 (E) Rotary	SPEAKER
S10	1-552-141-00 (E) Pushbutton	POWER (AEP, UK, E model)
S10	1-552-246-00 Pushbutton	POWER (US, Canadian model)
VS1	1-552-535-00 (C) Voltage Selector	(AEP, UK, E model)
JACKS		
J101, 151	1-507-470-31 (C) 4 p Phono	PHONO1, PHONO 2 (HEAD AMP)
J102, 152	1-507-430-31 (D) 6 p Phono	TUNER, AUX 1, AUX 2
J103, 153	1-507-429-31 (D) 8 p Phono	TAPE 1, TAPE 2, REC OUT 1, REC OUT 2
J105, 155	1-507-502-00 (F) Phone	TAPE 2, REC OUT 2
J106, 156	1-507-470-31 (C) 4 p Phono	POWER INPUT, PRE OUTPUT
J109, 159	1-507-454-00 (C) Phone	HEADPHONES

Note: Les composants identifiés par un trame et une marque A sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No. Part No. Description

MISCELLANEOUS

CNJ1	1-509-546-11 (C) Socket	3 p; ~ AC IN (AEP, UK, E model)
CNJ801-803	1-526-574-00 Socket	3 p; AC OUTLET (US, Canadian model)
CNP1	1-551-511-11 Cord	power (US, Canadian model)
CP1	1-231-326-11 Encapsulated Component	(US model)
CP1	1-231-341-00 Encapsulated Component	(Canadian model)
F801	1-532-272-XX Fuse	5A (US, Canadian model)
F801	1-532-286-00 (B) Fuse	2.5AT (AEP model: up to serial No. 501, 150) (UK model: up to serial No. 600, 050) (E model: up to serial No. 400, 100)
F801	1-532-237-00 (B) Fuse	3, 15AT (AEP model: serial No. 501, 151 and later) (UK model: serial No. 600, 051 and later) (E model: serial No. 400, 101 and later)
F802	1-532-496-00 Fuse	thermal; 10A 109°C (US, Canadian model)
F802	1-532-505-00 (B) Fuse	5AT (AEP model: up to serial No. 501, 150) (UK model: up to serial No. 600, 050) (E model: up to serial No. 400, 100)
F802	1-532-325-00 (B) Fuse	6.3AT (AEP model: serial No. 501, 151 and later) (UK model: serial No. 600, 051 and later) (E model: serial No. 400, 101 and later)
F803	1-532-496-00 (C) Fuse	thermal; 10A 109°C (AEP, UK, E model)

Note: The components identified by shading and mark A are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un trame et une marque A sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note: Circled letters (A to Z) are applicable to European models only.

Ref. No.	Part No.	Description
ME901, 951	1-520-314-00 (K) Meter	including PL801, 851
PL801, 851	1-518-273-00 (B) Lamp	meter; included in ME901, 951
RY301, 351	1-515-257-00 (H) Relay	
RY801	1-515-278-00 (F) Relay	
TM1, 2	1-535-057-00 (E) Terminal Strip	4 p push; SPEAKER A, SPEAKER B
	1-506-370-00 (B) Plug	jumper
	1-509-848-00 (B) Socket	transistor
	1-543-060-00 (E) Core	bead

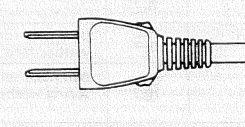
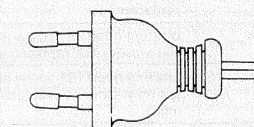
ACCESSORIES AND PACKING MATERIALS

Part No.	Description
1-506-113-00 (B) Shorting Plug	
1-534-754-00 Cord	power; parallel-blade plug (E model)
1-534-819-00 (G) Cord	power (UK model)
1-551-216-00 Cord	power; euro-plug (E model)
3-701-020-00 (A) Bag	check sheet
3-701-622-00 (A) Bag	plastic (Canadian, UK model)
3-770-247-11 (E) Manual	instruction (AEP, UK, E model)
3-770-247-21 Manual	instruction (US, Canadian model)
3-794-233-21 Sheet	consumer products (US model)
4-848-648-00 (B) Bag	protection
4-851-860-00 (F) Carton	
4-851-861-00 (B) Cushion	

— Power Cord —

euro-plug

parallel-blade plug





1/4 WATT CARBON RESISTORS <sup>Ⓐ</sup>Note: Circled letter <sup>Ⓐ</sup> is applicable to European models only.

Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.
1.0	1-246-401-00	10	1-246-425-00	100	1-246-449-00	1.0k	1-246-473-00	10k	1-246-497-00	100k	1-246-521-00	1.0M	1-246-545-00
1.1	1-246-402-00	11	1-246-426-00	110	1-246-450-00	1.1k	1-246-474-00	11k	1-246-498-00	110k	1-246-522-00	1.1M	1-210-814-00
1.2	1-246-403-00	12	1-246-427-00	120	1-246-451-00	1.2k	1-246-475-00	12k	1-246-499-00	120k	1-246-523-00	1.2M	1-210-815-00
1.3	1-246-404-00	13	1-246-428-00	130	1-246-452-00	1.3k	1-246-576-00	13k	1-246-500-00	130k	1-246-524-00	1.3M	1-210-816-00
1.5	1-246-405-00	15	1-246-429-00	150	1-246-453-00	1.5k	1-246-577-00	15k	1-246-501-00	150k	1-246-525-00	1.5M	1-210-817-00
1.6	1-246-406-00	16	1-246-430-00	160	1-246-454-00	1.6k	1-246-578-00	16k	1-246-502-00	160k	1-246-526-00	1.6M	1-210-818-00
1.8	1-246-407-00	18	1-246-431-00	180	1-246-455-00	1.8k	1-246-579-00	18k	1-246-503-00	180k	1-246-527-00	1.8M	1-210-819-00
2.0	1-246-408-00	20	1-246-432-00	200	1-246-456-00	2.0k	1-246-580-00	20k	1-246-504-00	200k	1-246-528-00	2.0M	1-210-820-00
2.2	1-246-409-00	22	1-246-433-00	220	1-246-457-00	2.2k	1-246-581-00	22k	1-246-505-00	220k	1-246-529-00	2.2M	1-210-821-00
2.4	1-246-410-00	24	1-246-434-00	240	1-246-458-00	2.4k	1-246-582-00	24k	1-246-506-00	240k	1-246-530-00	2.4M	1-244-754-00
2.7	1-246-411-00	27	1-246-435-00	270	1-246-459-00	2.7k	1-246-583-00	27k	1-246-507-00	270k	1-246-531-00	2.7M	1-244-755-00
3.0	1-246-412-00	30	1-246-436-00	300	1-246-460-00	3.0k	1-246-584-00	30k	1-246-508-00	300k	1-246-532-00	3.0M	1-244-756-00
3.3	1-246-413-00	33	1-246-437-00	330	1-246-461-00	3.3k	1-246-585-00	33k	1-246-509-00	330k	1-246-533-00	3.3M	1-244-757-00
3.6	1-246-414-00	36	1-246-438-00	360	1-246-462-00	3.6k	1-246-586-00	36k	1-246-510-00	360k	1-246-534-00	3.6M	1-244-758-00
3.9	1-246-415-00	39	1-246-439-00	390	1-246-463-00	3.9k	1-246-587-00	39k	1-246-511-00	390k	1-246-535-00	3.9M	1-244-759-00
4.3	1-246-416-00	43	1-246-440-00	430	1-246-464-00	4.3k	1-246-488-00	43k	1-246-512-00	430k	1-246-536-00	4.3M	1-244-760-00
4.7	1-246-417-00	47	1-246-441-00	470	1-246-465-00	4.7k	1-246-489-00	47k	1-246-513-00	470k	1-246-537-00	4.7M	1-244-761-00
5.1	1-246-418-00	51	1-246-442-00	510	1-246-466-00	5.1k	1-246-490-00	51k	1-246-514-00	510k	1-246-538-00	5.1M	1-244-762-00
5.6	1-246-419-00	56	1-246-443-00	560	1-246-467-00	5.6k	1-246-491-00	56k	1-246-515-00	560k	1-246-539-00		
6.2	1-246-420-00	62	1-246-444-00	620	1-246-468-00	6.2k	1-246-492-00	62k	1-246-516-00	620k	1-246-540-00		
6.8	1-246-421-00	68	1-246-445-00	680	1-246-469-00	6.8k	1-246-493-00	68k	1-246-517-00	680k	1-246-541-00		
7.5	1-246-422-00	75	1-246-446-00	750	1-246-470-00	7.5k	1-246-494-00	75k	1-246-518-00	750k	1-246-542-00		
8.2	1-246-423-00	82	1-246-447-00	820	1-246-471-00	8.2k	1-246-495-00	82k	1-246-519-00	820k	1-246-543-00		
9.1	1-246-424-00	91	1-246-448-00	910	1-246-472-00	9.1k	1-246-496-00	91k	1-246-520-00	910k	1-246-544-00		

## HARDWARE NOMENCLATURE

Screw:

P 3 x 10

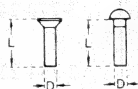
L: Length in mm

D: Diameter in mm

Type of head

Indicated slotted-head only.

Unless otherwise indicated, it means cross-recessed head (Phillips type).



Nut, Washer, Retaining ring:

N 3

Diameter of usable screw or shaft

Reference designation

Reference Designation	Shape	Description	Remarks
<b>SCREWS</b>			
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		brazer-head screw	

Reference Designation	Shape	Description	Remarks
<b>SELF-TAPPING SCREWS</b>			
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self-tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
<b>SET SCREWS</b>			
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
<b>NUT</b>			
N		nut	
<b>WASHERS</b>			
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
<b>RETAINING RINGS</b>			
E		retaining ring	
G		grip-type retaining ring	



# INTEGRATED STEREO AMPLIFIER

# TA-F6B

## SUPPLEMENT

File this supplement with the service manual.

CIRCUIT DESCRIPTION

*US Model*  
*Canadian Model*  
*AEP Model*  
*UK Model*  
*E Model*

No. 1  
Jan. 1979

**SONY**  
SERVICE MANUAL



This audio amplifier is equipped with a pulse-locked power supply which has the following desirable features:

- 1) Better regulation (less than 1%) due to impedance as low as 1/15 of conventional power supply impedance.
- 2) Square waves as high in frequency as 20 kHz are used, so hum does not occur.
- 3) Small in size and lightweight. Approximately 1/2 the volume and 1/4 to 1/8 the weight of a conventional power supply.
- 4) Operable even with a dc power source.

The circuit of this pulse-locked power supply is outlined below (See Fig. 1).

## 1. Surge-Current Control Circuit (See Fig. 2 or Fig. 3)

This circuit suppresses the large surge-current which occurs when the power switch S10 is first turned on, thereby preventing the burning of the switch contact and unnecessary blowing of the fuse.

In the pulse-locked power supply circuit, ac line current is directly rectified and smoothed. Since a very-large charge-current (surge-current) flows into the smoothing capacitor C801 (and C805 in AEP, UK, E models), the surge-current control circuit is required.

- When the power switch is turned on, the current flows through R801 and R802 to suppress the surge-current. After the secondary-rectified current starts to flow, the relay RY801 is turned on to shunt R801 and R802 out of the circuit.

## 2. Line Filter (See Fig. 2 or Fig. 3)

This filter prevents high-frequency noise (generated in the chopper-type voltage regulator and inverter circuits) from entering the ac power line.

- The filter consists of coil L601 with bifilar windings on a ferrite-ring core and three capacitors C601–C603. Noise which appears between the ac line and the ground (common-mode noise, See Fig. 4.) is suppressed, thereby reducing the amount of unwanted radiation (noticeable when this amplifier is connected to preamplifier, tuner, turntable, etc.) to insignificant levels.
- Furthermore, noise radiated directly from the voltage regulator and inverter circuits is suppressed by an aluminum diecast shield, while any leakage of noise to the dc output terminals is stopped by the LC filter of the secondary rectifier.

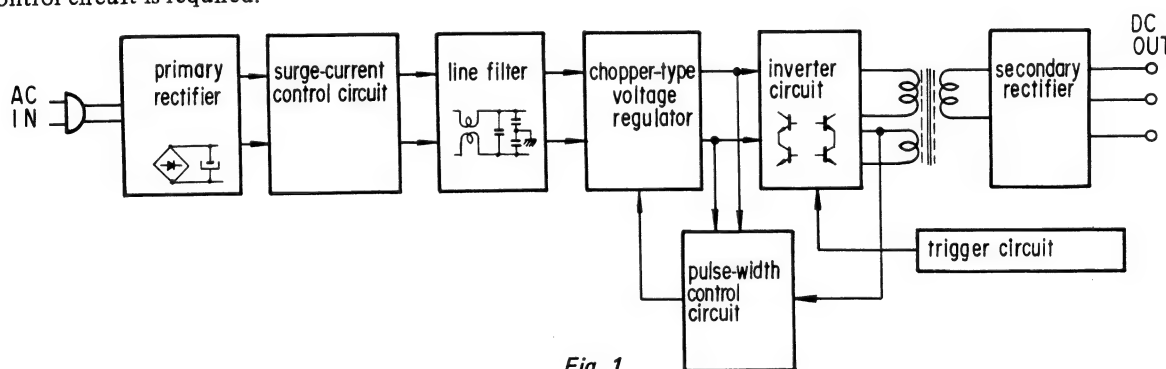


Fig. 1

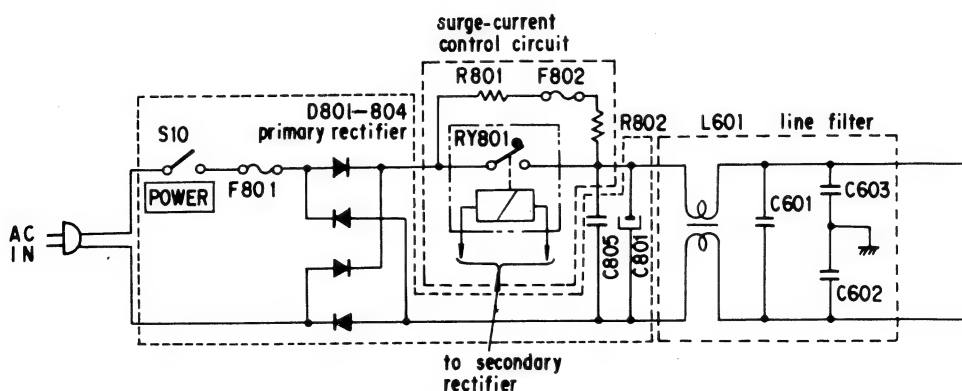


Fig. 2 (US, Canadian Model)



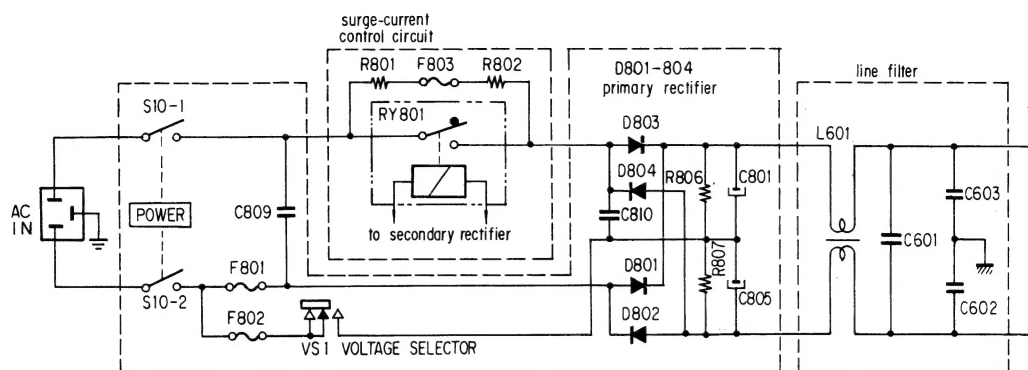


Fig. 3 (AEP, UK, E Model)

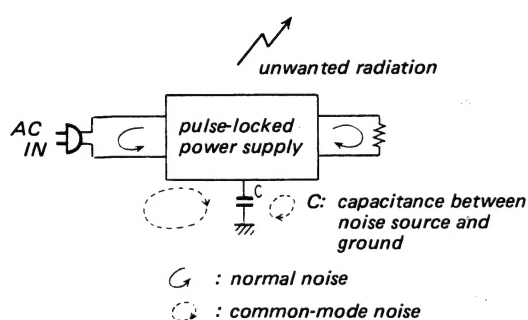


Fig. 4

### 3. Chopper-Type Voltage Regulator (See Fig. 5)

This voltage regulator circuit, formed by the high-speed switching circuit (Q601–603, Q613) and demodulation filter (low-pass filter L604, C613), maintains a constant voltage output (applied to the inverter) despite fluctuations in input voltage and load.

- Control signals from the error amplifier activate the high-speed switching circuit, turning the output on and off. This output is smoothed out by L604 and C613 to obtain a constant voltage.
- D601 (flywheel diode) is used to release the stored magnetic energy (accumulated when Q601 and Q613 are on) from the choke coil L604 when Q601 and Q613 are turned off. This diode also improves the switching characteristics.

When D601 is on, the energy in the choke coil is supplied through this diode to the output circuit.

- Without this diode, the energy accumulated in the choke coil (when Q601 and Q613 are on) would result in very high voltage levels when Q601 and Q613 are turned off, and would probably damage these two transistors.
- The circuit diagram in Fig. 5 is simplified to the circuit diagram in Fig. 6.

The switching transistor Q1 is turned on and off by PWM (pulse-width modulation) waves applied to its base. Output voltage stability is achieved by varying the period that the switching transistor Q1 is on ( $T_{on}$ ) or off ( $T_{off}$ ). The relevant waveforms are shown in Figs. 7 and 8.

- If, for example, the output voltage tends to drop because of a load fluctuation, the degree of fluctuation is detected by the error amplifier, resulting in a change in  $T_{on}/T_{off}$  ratio. That is, the switching transistor remains on for a longer time, thereby compensating for the output voltage drop.
- If the output voltage then tends to increase (due to further load fluctuation) the error amplifier will again detect the degree of fluctuation, and consequently shorten the period that Q1 is on. Output voltage is stabilized by utilizing the operations described in 1) and 2) above.

The relation between  $E_0$  and  $E_1$  is given by the following expression:

$$E_0 = E_1 \cdot \frac{T_{on}}{T_{on} + T_{off}}$$

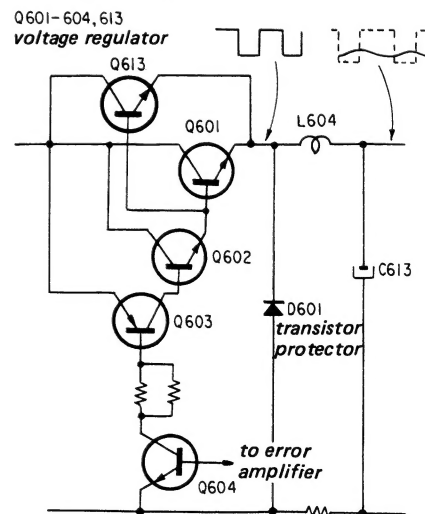


Fig. 5



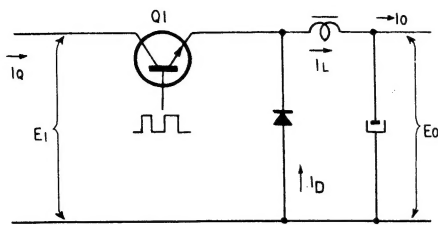


Fig. 6

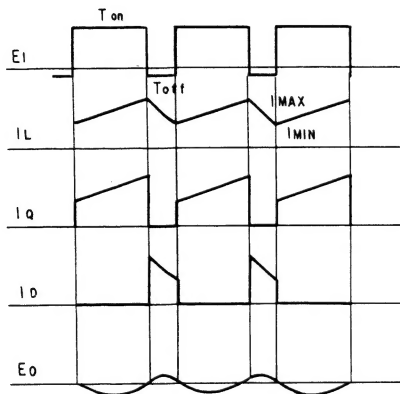


Fig. 7

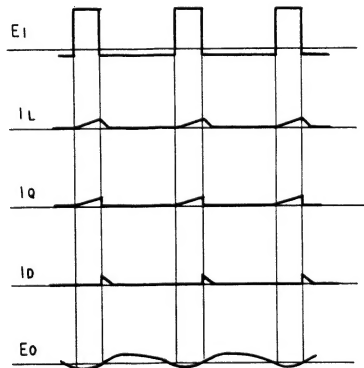


Fig. 8

#### 4. PWM (Pulse-Width Modulation) Circuit (See Fig. 9)

This circuit is used to control the chopper-type voltage regulator to maintain constant inverter output voltage. Square-wave pulses from the inverter are converted into sawtooth waves, and are then compared with a reference voltage level.

- The circuit diagram in Fig. 9 is simplified to the circuit diagram in Fig. 10.

1) The fluctuating output voltage is divided by the detector resistors R609, R610 and RT601, and the divided voltage  $V_0$  applied to Q606.

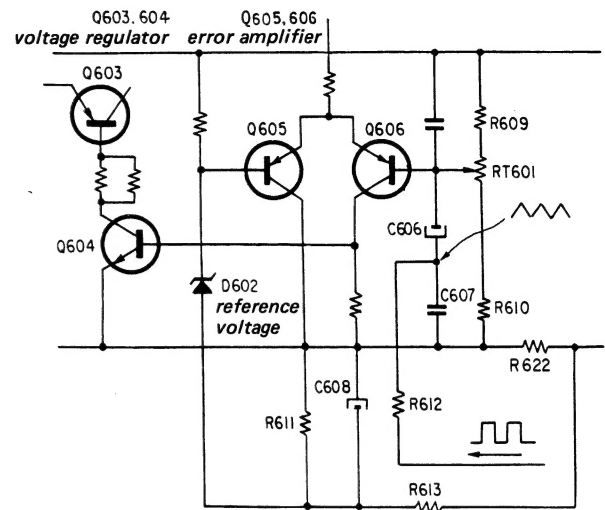


Fig. 9

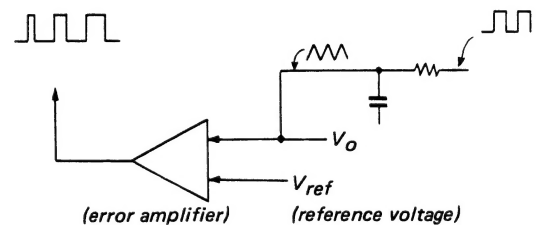


Fig. 10

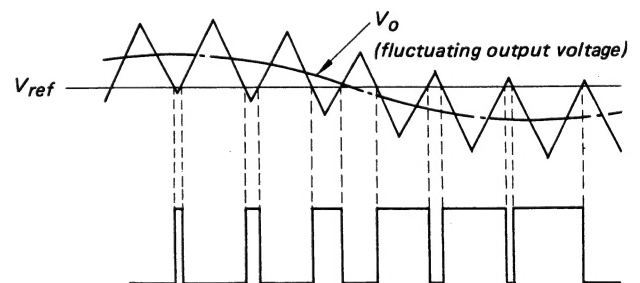


Fig. 11

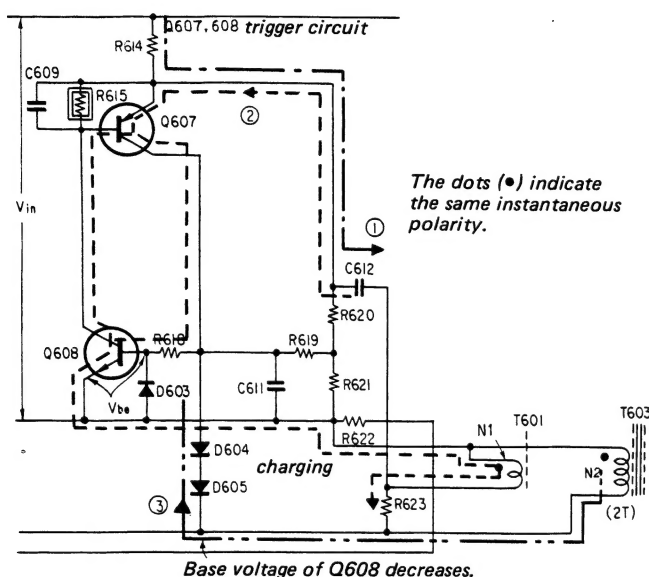
In addition, the pulses from the inverter are converted into sawtooth waves, by the integrating circuit R612, C607, and added to  $V_0$  through C606.

- Variations in regulation are corrected by R611, R613, R622 and C608, while the reference voltage  $V_{ref}$  (stabilized by the zener diode D602) is applied to the base of Q605.
- When the combined sawtooth wave and reference voltage  $V_{ref}$  are compared and amplified by the error amplifier Q605 and Q606, the output will be pulse-width modulated as shown in Fig. 11.



### 5. Inverter Trigger Circuit (See Fig. 12)

When the power switch is turned on, this circuit supplies a trigger pulse to the winding N1 of T601 to start the inverter oscillating.



*Fig. 12*

- 1) When the power switch is turned on, C612 is charged through R614 (route ①).
- 2) Once the voltage difference  $V_{be}$  between base and emitter of Q608 satisfies the following relation:

- 2) Once the voltage difference  $V_{be}$  between base and emitter of Q608 satisfies the following relation:

$$\frac{R_{621}}{R_{614} + R_{620} + R_{621}} \cdot V_{in} > 0.6 \text{ V}$$

Q607 and Q608 will turn on.

- 3) When these two transistors are on, the charge on C612 is applied as a pulse signal to N1 through Q607 and Q608 to start the inverter oscillating. (route ② ).

- 4) Once the inverter starts to oscillate, the voltage generated in winding N2 of T603 is rectified by D604 and D605 (thereby obtaining a minus voltage), resulting in a decrease of the Q608 base voltage. Then transistors Q607 and Q608 turn off (route ③).

- 5) Q607 and Q608 turn off so that winding N1 of T601 is not loaded with C612, Q607 and Q608, thereby permitting normal inverter-starting operation.

## 6. Inverter Circuit (See Fig. 13)

This bridge-type inverter circuit, consisting of four power transistors Q609-Q612, generates square-wave signals by using a constant dc voltage supplied from the chopper-type voltage regulator. High-frequency transformer T603 isolates the secondary circuit from the primary circuit and also changes the voltage.

The circuit diagram in Fig. 13 is simplified to the circuit diagram in Fig. 14.

- The secondary voltage waveform of the high-frequency transformer shown in Fig. 15 is obtained by switching S1 and S4 alternately, and S2 and S3 alternately. The dc voltage is consequently converted into square waves.

- The inverter circuit (Fig. 13) operates in the following manner.

- 1) A trigger pulse signal is applied to N1 from the inverter trigger circuit.

- 2) For example, an initial pulse produces voltages which cause the transistors connected to N4 and N5 to turn on and the transistors connected to N3 and N6 to turn off.

- 3) Q610 and Q611 turn on and the current flows from the  $\oplus$  terminal to the  $\ominus$  terminal through Q611, N7, N8, and Q610.

- 4) The current flowing through N10 will be proportional to the current flowing to T603 through T602.

This current flowing through N10 produces voltages in N4 and N5. Such voltages turn on Q610 and Q611.

- 5) The transformer T602 is used to adjust the amount of current feedback.

- 6) Furthermore, since N2 is wound on T603, N2 generates a voltage which will be applied to N1 through R623.

- 7) Since N1 is wound on T601, voltages will be generated in N4 and N5, and will also turn Q610 and Q611 on again (voltage feedback).

- 8) Q610 and Q611 are sufficiently saturated by these two types of feedback (current and voltage) and supply the power to T603. T603 is then saturated and will no longer generate enough voltage to turn Q610 and Q611 on.



- 9) Q610 and Q611 turn off, and a voltage of opposite polarity is generated in N2.
- 10) This voltage of opposite polarity consequently produces a magnetic field in the opposite direction, generating voltages in N3 and N6. Such voltages turn Q609 and Q612 on.

- 11) Once these two transistors Q609 and Q612 are turned on, voltage and current feedbacks will keep Q609 and Q612 on until T601 is saturated in the same way as in the previous half cycle. Then Q610 and Q611 turn on again to continue inverter oscillation.

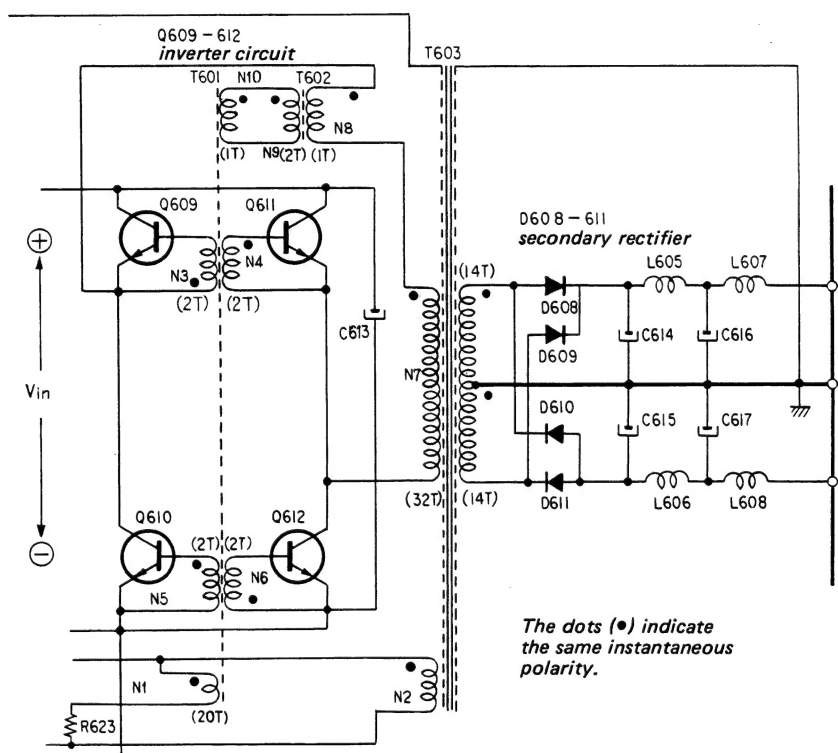


Fig. 13

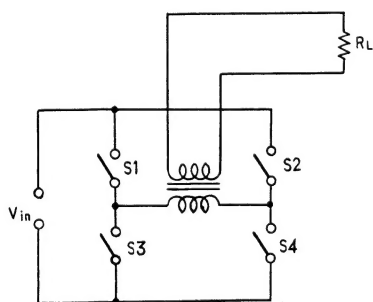


Fig. 14

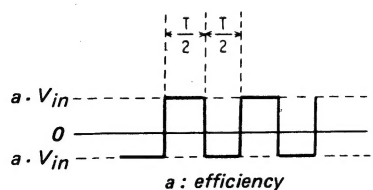


Fig. 15

## 7. Secondary Rectifier

- This is a rectifier/smoothing circuit which converts the square-wave (changed to the desired voltage by the high-frequency transformer) back into a direct current.
- The high-speed switching diode ensures low loss in the rectification of the square-waves.
- The smoothing circuit uses an LC filter. Due to the square-wave power input, even small value LC components ensure high smoothing efficiency.